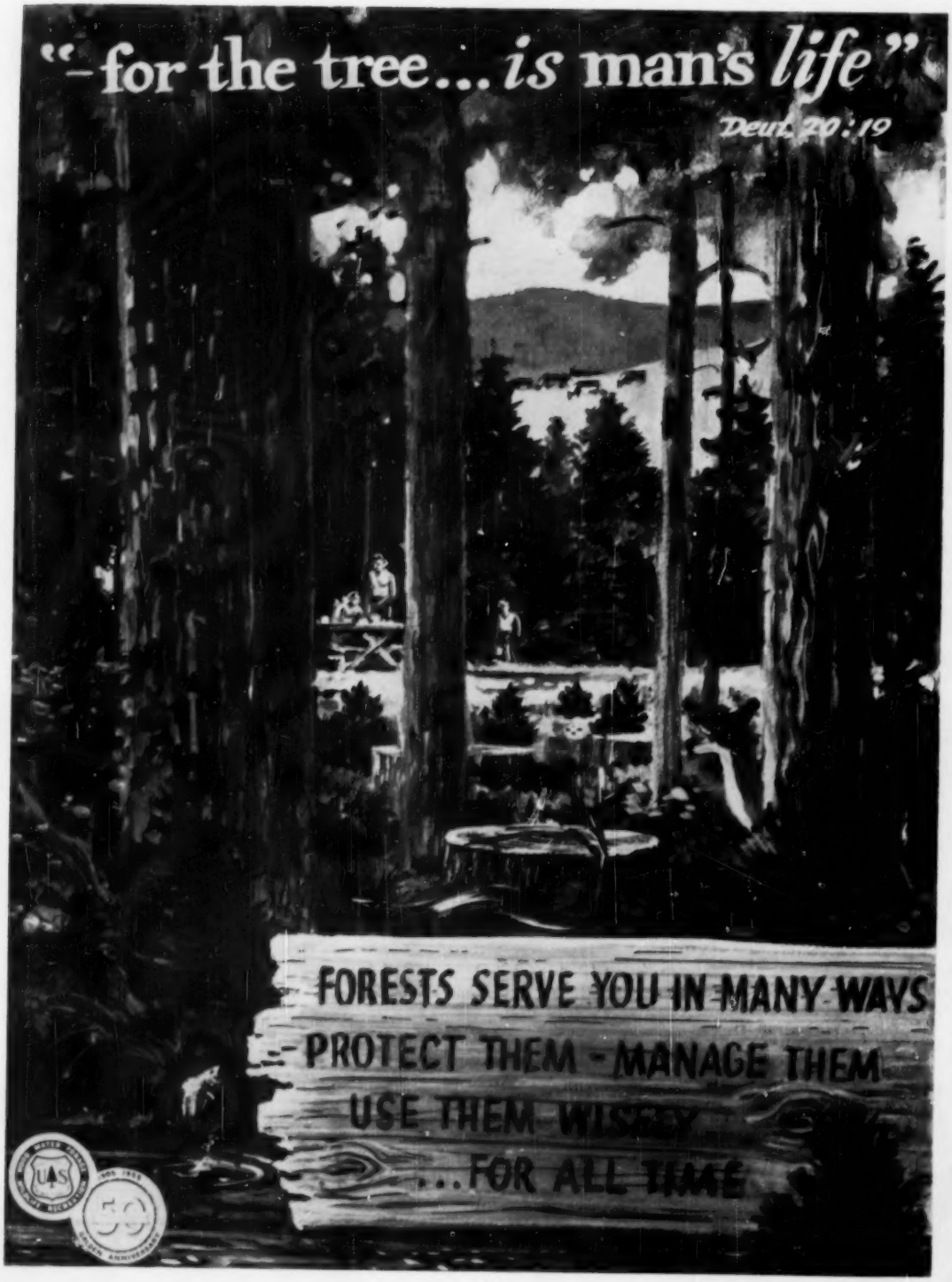
Journal of FORESTRY

JANUARY 1955

University Microfilms
313 N. First Street
Ann Arbor, Michigan
CP



SOCIETY OF AMERICAN FORESTERS 1900

Volume 53
Number 1

Chief T.P. Treadwell of Fort Collins, Colorado

(Winner of 1st place in fire prevention in cities of less than 20,000)

SAYS:

"INDIAN FIRE PUMPS are an indispensable fire fighting tool!"

Our congratulations to Chief Treadwell and his highly efficient department for their splendid performance. Shown below are members of Engine Company No. 1 with their INDIAN FIRE PUMPS.

Do you have an ample supply of these famous back pack extinguishers?

We are particularly pleased with the part INDIAN FIRE PUMPS have played in enabling the city of Fort Collins, Colorado to win these outstanding awards for fire prevention:

1950, 1st place in U. S. in cities of less than 20,000—U. S. Chamber of Commerce.

1950 2nd place in U. S. cities of all sizes—Fire Underwriters Contest.

1949 3rd place cities of all sizes.

1947 National Grand Award in the U. S. in cities of all sizes.

16 consecutive years among the top 10 cities in the U. S. in fire prevention.

"CHOICE FOR QUALITY THE WORLD OVER"

Send for circular telling all about INDIAN FIRE PUMPS

D. B. SMITH & CO.

407 MAIN ST.
UTICA 2, N.Y.

PACIFIC COAST BRANCHES

Hercules Equipment & Rubber Company, Inc.
435 Brannan Street
San Francisco 7, California

Halprin Supply Company
1355 S. Flower Street
Los Angeles, California

Fred E. Barnett Company
2005 S. E. 8th Ave.
Portland, Oregon

Fred E. Barnett Company
600 Spring Street
Klamath Falls, Oregon

Mill & Mine Supply, Inc.
625 Lander Street
Seattle 4, Washington

L. N. Curtis & Sons
426 West Third Street South
Salt Lake City, Utah

CANADIAN AGENTS:

Fleck Bros. Limited
110 Alexander Street
Vancouver, B. C., Canada

C. E. Hickey & Sons, Ltd.
Hamilton, Canada

VOLUME 53 • NUMBER 1 JANUARY 1955

Journal of Forestry

Editorial Staff

ARTHUR B. MEYER ..... *Editor*

HENRY CLEPPER ..... *Managing Editor*

L. AUDREY WARREN ..... *Business Manager*

Associate Editors

HAROLD H. BISWELL, *Range Management*, School of Forestry, University of California, Berkeley 4, Calif.

ROBERT R. BLUMENSTEIN, *Forest and Wood Utilization*, Timber Engineering Company, 4812 Minnesota Avenue, N. E., Washington 19, D. C.

CHARLES C. BUCK, *Forest Fire*, California Forest and Range Experiment Station, P.O. Box 245, Berkeley 1, Calif.

JOHN W. DUFFIELD, *Silviculture*, % Forest Industries Nursery, Nisqually, Wash.

S. R. GEVORKIANTZ, *Mensuration*, Lake States Forest Experiment Station, University Farm, St. Paul 1, Minn.

MARVIN D. HOOVER, *Forest Influences and Soils*, Division of Forest Influences, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.

HARVEY J. MACALONEY, *Forest Pathology and Entomology*, Lake States Forest Experiment Station, St. Paul 1, Minn.

RALPH W. MARQUIS, *Forest Economics and Policy*, Northeastern Forest Experiment Station, 102 Motors Avenue, Upper Darby, Pa.

CLARENCE W. RICHEN, *Forest Management and Engineering*, Crown Zellerbach Corporation, Public Service Building, Portland 4, Ore.

PHILIP C. WAKELEY, *Forest Genetics and Artificial Regeneration*, Southern Forest Experiment Station, 704 Lowich Building, 2026 S. Charles Avenue, New Orleans 13, La.

LEE E. YEAGER, *Forest-Wildlife Management and Recreation*, Colorado Cooperative Wildlife Research Unit, 243 Forestry Building, Colorado A & M College, Fort Collins, Colo.

LLOYD THORPE, *Advertising Representative*, 604 Medical Arts Building, Seattle 1, Wash.

The JOURNAL OF FORESTRY, established in 1917, is the official organ of the Society of American Foresters, but the Society assumes no responsibility for the statements and opinions expressed by contributors.

Publication office, 425 Mills Building, 17th Street at Pennsylvania Avenue N. W., Washington 6, D. C. Address all correspondence concerning editorial or business matters to JOURNAL OF FORESTRY, 425 Mills Building, 17th Street at Pennsylvania Avenue N. W., Washington 6, D. C. Published monthly. Subscription $7.50 per year; single copies 75 cents. Missing numbers will be replaced without charge provided claim is made within thirty days after date of the following issue.

The editors are not responsible for loss or damage of manuscripts and photographs while in transit or in their possession. All material submitted for publication should be accompanied by return postage.

Copyright, 1955, by the Society of American Foresters. Entered as second-class matter at the post office at Washington, D. C. Acceptance for mailing at the special rate of postage provided for in the Act of February 28, 1925, embodied in Paragraph 4, Section 412, P. L. and R., authorized November 10, 1927.

CONTENTS

COVER: U. S. Forest Service poster to commemorate that organization's fiftieth anniversary, February 1955. See the February issue of the JOURNAL which will be devoted to the half century of public service by this agency.

The 54th Annual Meeting 3

W. L. Hall and Tom Gill Honored at Awards of Pinchot and Schlich Medals 4

A Broad Look at Our Resource Problems 6
R. G. Gustavson

A Method of Thinning and Forecast of Yield in Douglas-fir 10
Svend O. Heiberg and *Philip G. Haddock*

Determining the Direction of Destructive Winds in a Rocky Mountain Timber Stand 19
Robert R. Alexander and *Jesse H. Buell*

Early Tapping for More Quality Sirup 24
Robert R. Morrow

Adaptation and Use of a Form Class Slide Rule for Estimating Log Diameters in Standing Trees ..... *E. R. Wilcox* 26

Planting Stock Grades for Yellow-Poplar 28
G. A. Limstrom, R. F. Finn, and *G. H. Deitschman*

Notes 33
A Grafting Technique for Forest Genetics Research; New Diameter Increment Rule; Pine Squirrels Reduce Future Crops of Ponderosa Pine Cones.

Points of View 36
Comments on "Growing Stock in the All-Aged Forest."

Reviews 37
The Practice of Silviculture; The Wilderness World of John Muir; Planting the Southern Pines; The Nation Looks at its Resources; Those of the Forest; Publications of Interest.

Current Literature 40

Society Affairs 41

Forestry News 74

Index to Advertisers 86

Consulting Foresters Directory 87

THE STORY OF TREE FARMING | One of a series of advertisements appearing in several national magazines in the interest of better public understanding of tree farming and the forest products industry.

ELK HERD moving to lower altitude after first snow on a Pacific Northwest tree farm. Clear-cut areas at lower elevation provide winter forage, while stands of seed trees afford shelter.

tree farms provide benefits for man and wildlife...

Architects are using more and more wood to bring comfort and individuality into modern homes. The warmth of natural wood is ideal for this pleasant, informal den.

A perpetual supply of wood for lumber, pulp, paper and countless other products is the main objective of America's 5,400 tree farmers. However, scientific management of timber as a crop on privately owned tree farms produces other benefits of great importance to both man and wildlife.

Good forest management plans consider the relationship between the business of providing a permanent supply of wood for the nation and such other factors as watersheds, food and shelter for wildlife, and recreation areas. Timberlands which are properly managed help retain moisture and rainfall in the forest soil to supply streams, lakes and water tables. Wildlife thrives on tree farms, finding abundant forage in the harvested areas and shelter in the larger timber stands. On tree farms, constant protection from fire, insects and disease helps preserve these many benefits for America.

Today, about 32 million acres of tax-paying timberland all across the nation are operated as tree farms. All Weyerhaeuser Timber Company forestlands are certified tree farms. *Write us at Box A, Tacoma, Washington for a free booklet,* ***Tree Farming in the Pacific Northwest.***

Weyerhaeuser Timber Company

Journal of Forestry

Official Organ of the Society of American Foresters

The 54th Annual Meeting

MILWAUKEE was the scene of the 54th annual meeting of the Society of American Foresters. Held last October 25-27, the conference attracted an attendance of 706 men and 125 ladies. Members were present from 45 states and Alaska, with 10 from Canada, and 2 from foreign countries.

The three-day conference consisted of an opening general session, a Society Affairs session, and 11 technical sessions. Premeeting conferences were held on October 23 by the Council of Forestry School Executives; and on October 24 by the Council of the Society, the Committee on Accrediting, the editorial board of the JOURNAL OF FORESTRY, the Association of Consulting Foresters, and the Council of State Forestry Association Executives. There was a joint evening business meeting of the S.A.F. Council and delegates from each of the 21 Sections.

The General Session

Carrying out the theme "Our Changing Forests," Chairman Jay H. Price opened the general session by introducing M. B. Dickerman of the Lake States Forest Experiment Station who described "The Forests of the Central and Lake States Region." "Problems and Potentials of the Fiber Industry" were discussed by D. Clark Everest of Marathon Corporation and J. F. Sharpe of the Ontario Department of Lands and Forests.

Burton F. Swain of the National Veneer and Lumber Company described the utilization of hardwoods. Finally, two papers were presented on the subject, "Management of Our Changing Forests." J. B. Millar of Kimberly-Clark Corporation outlined management developments in the northern forests; R. H. Westveld of the University of Missouri told of central hardwoods management.

Society Affairs

At the Society's annual business meeting President E. L. Demmon presided. His annual report is published elsewhere in this issue, as are all other reports given at this session. These included reports by Henry Clepper, executive secretary, and Arthur B. Meyer, editor.

In addition to reports of committees, two special reports were given. "The Society's Forestry Research Project" by Frank H. Kaufert, and a progress report on *Forest Science*, the proposed quarterly journal of forestry research, by Stephen H. Spurr. These will be found in the Society Affairs section of this issue.

GEORGE BANZHAF, toastmaster of the Society's 54th annual dinner.

Division Meetings

The 11 subject Divisions each held one or more technical sessions. The Divisions of Education, Watershed Management, and Public Relations held evening sessions on October 25. On October 26 the Division of Silviculture held an all-day session; half-day sessions were held by the Divisions of Forest Products, Private Forestry, Forest Recreation, and Forest-Wildlife Management.

On the morning of October 27 the Division of Economics and Policy and the Division of Education held a joint meeting, the Division of Range Management held an afternoon meeting, and the Division of Forest Management held an all-day session.

All were well attended.

Social Night

The evening of October 26 was set aside for conviviality. The members and their ladies were the guests of the four large Milwaukee breweries.

The occasion was used for forestry school alumni get-togethers, and resulted in a night of *Gemutlicheit*.

The Society Dinner

The meeting closed with the Society dinner which was served on the evening of October 27 in the Schroeder Hotel Crystal Ballroom. The attendance exceeded 500.

Preceding the dinner, the members and their ladies were the guests at a reception and social hour of the forest landowning paper companies of Wisconsin.

Genial George Banzhaf was toastmaster for the dinner, during which President Demmon presented the Gifford Pinchot Medal to William L. Hall, and the Sir William Schlich Memorial Medal to Tom Gill.

A scholarly address entitled "A Broad Look at Our Resource Problems" was given by Dr. R. G. Gustavson, president of Resources for the Future, Inc.

The dinner was concluded by a delightful program of music by the Obert-Anthony Orchestra and singers.

All in all, the meeting was one of the most notable and enjoyable in the Society's history.

W. L. Hall and Tom Gill Honored by Awards of Pinchot and Schlich Medals

Presentation of the
Gifford Pinchot Medal
to William Logan Hall
by E. L. Demmon, President
Society of American Foresters
Milwaukee, Wisconsin
October 27, 1954

At the fiftieth anniversary meeting of the Society of American Foresters held in Washington, D. C. in December 1950, the premier award was made of the Gifford Pinchot Medal. Graciously donated by Mrs. Pinchot, this medal commemorates the eminent American forester who was founder and first president of the Society of American Foresters, chief of the U. S. Forest Service, and distinguished public figure.

The first award of the Medal was to Henry S. Graves, also a founder and past president of the Society, chief of the Forest Service, and dean of the Yale University School of Forestry. The second award, made in 1952, was to Raphael Zon, past editor of the JOURNAL OF FORESTRY, and architect of America's system of federal forest experiment stations.

The third presentation of the Medal, which I now have the honor to make in behalf of the Society of American Foresters, is to one of our profession's most respected and beloved practitioners, a forester who was one of the seven founding members of the Society when it was organized in Mr. Pinchot's office in November 1900, and who is still, fifty-four years later, actively practicing forestry on his woodlands in Arkansas.

PRESIDENT DEMMON presenting the Gifford Pinchot Medal to William L. Hall.

William L. Hall was born May 28, 1873 in Holden, Missouri. He studied forestry and horticulture at Kansas State Agricultural College, receiving the bachelor of science degree in 1899. In the latter year he received an appointment to the U. S. Department of Agriculture Division of Forestry, now the Forest Service, and organized the well-known tree nursery at Halsey, Nebraska. After several years of pioneering reforestation work, he was put in charge of the Forest Service Branch of Products from 1905 to 1911, during which period the world renowned Forest Products Laboratory was set up, in the establishment of which he was influential.

The passage in 1911 by the Congress of the Weeks Law, which provided for national forest acquisition in the East, brought about his most important assignment to date. He made surveys of the White Mountains in New England and the Southern Appalachians to determine the suitability of purchasing land for national forests, and later became the first district (now regional) forester of the eastern United States.

During the first World War (1918-1919) he served in the Army as a major assigned to the office of the chief, Corps of Engineers. Returning to the Forest Service, he resigned within the year in order to organize a private timber enterprise Hall, Kellogg and Company; and later engaged in the sale of timber properties for Baker, Fentress and Company of Chicago.

Beginning in 1928 he began the purchase and management of timber properties on his own account, a business enterprise that has kept him active in the outdoor career of a forester ever since. For a number of years, with headquarters in Hot Springs, Arkansas, he was managing director of the Dermott Land and Timber Company, restoring to productivity a woods property of 24,000 acres; and served lumber and pulpwood companies in the South and West as a consulting forester. For the past decade he has limited his practice to the management of his own timber estate in Arkansas.

Today William L. Hall is one of our profession's most loyal adherents of the private enterprise system and to the proposition that forestry can be a profitable commercial business. In successfully applying the profit motive to private forest management, his career has been an encouragement to many younger foresters for it has been characterized by high ethical business principles and professional conduct.

Equally as impressive as his professional contributions is his record of service to the Society of American Foresters. In addition to having been one of seven charter members, Mr. Hall served as Society treasurer for five years during the period 1903-1907, as president in 1913, as a member of the Executive Council in 1918 and 1919, and as a member of numerous committees over a period of a half century.

In 1940 he was elected a Fellow, the Society's highest membership honor; and at the Society's fiftieth anniversary meeting in Washington, D. C. December 1950, he was presented with a plaque, made especially for him and for that occasion, in the shape and color of the Society's well known emblem. And now I have the honor to present him with the Gifford Pinchot Medal.

I am sure that if the great "G.P." in whose name this award is made could be with us tonight, he would be delighted to know that the recipient is his old friend and loyal lieutenant Billy Hall.

William Logan Hall, accept with assurance of the affection and esteem of your fellow members of the Society of American Foresters this Gifford Pinchot Medal for outstanding service to forestry.

Presentation of the Sir William Schlich Memorial Medal to Tom Gill

by E. L. Demmon, President
Society of American Foresters
Milwaukee, Wisconsin
October 27, 1954

Sir William Schlich, born in 1840, inspector general of forests in India, professor of forestry at Oxford University, author of the monumental five-volume *Manual of Forestry*, probably exerted a greater influence on the advancement of world forestry than any other forester of his era.

Following his death in 1925, English speaking foresters throughout the world subscribed to a fund to establish a Foundation that would memoralize his distinguished services to forestry. Under the custody of the Empire Forestry Association in London, the annual proceeds from the trust fund of the Foundation are awarded in rotation to the various nations in the British Commonwealth and the United States.

When the first award was made to the United States in 1932, the Society of American Foresters was designated as its custodian. Sir William had been an Honorary Member of the Society. Hence it was appropriate that the Council of the Society should utilize the grant to finance the design and casting of a medal in his honor. Known as the Sir William Schlich Memorial Medal it is awarded by the Council of the Society in recognition of outstanding achievement in the advancement of forestry.

President Franklin D. Roosevelt was the recipient of the first medal, awarded in 1935 for his many services to the conservation of natural resources. Gifford Pinchot, founder and first president of the Society of American Foresters, received the second award in 1940. Thereafter, the medal was presented as follows:

To Henry S. Graves in 1944.
To William B. Greeley in 1946.
To Herman H. Chapman in 1948.
To Ralph S. Hosmer in 1950.
To Ellwood Wilson (posthumously) in 1952.

In behalf of the Society I now have the honor of making the eighth presentation of the Schlich Medal. The recipient is an American forester who has done as much perhaps as any living man to extend the art and science of forestry throughout the world. The name Tom Gill has become almost synonymous with international forestry.

PRESENTATION of the Sir William Schlich Memorial Medal to Tom Gill. *L* to *R*, President E. L. Demmon, Dr. Gill, George Banzhaf, toastmaster, and Vice President DeWitt Nelson.

Born in Philadelphia in 1891, Mr. Gill received the degree bachelor of arts from the University of Pennsylvania in 1913, and the degree master of forestry from Yale in 1915. In that year he entered the U. S. Forest Service as an assistant ranger. During the first world war he was an officer in the Air Service, U. S. Army, then returned to the Forest Service becoming a forest supervisor in 1922. He was in charge of Forest Service educational activities during 1922-1925. Following a year with the American Forestry Association as associate editor of *American Forests* magazine, he became secretary of the Charles Lathrop Pack Forestry Foundation in 1926 and is now the Foundation's executive director.

Beginning with a survey, partly aerial, of the forests of the Caribbean, Tom Gill's travels in behalf of forestry have been extensive. He was secretary of the forestry committee at the first international conference on food and agriculture held in Quebec in 1945, and was special adviser on forestry to the United Nations Conference on Food and Agriculture at Copenhagen in 1946; and has been chairman of the FAO Committee on Unexploited Forests since 1947. He was a delegate to the Inter-American Conference on Renewable Natural Resources in 1948; and chairman of the American delegation to the FAO Conference on Land Utilization in the Far East in 1951. During that year he served as adviser on forest policy for Japan, and in 1952 represented the United States at the Far East Forestry Commission meeting and developed a forest policy for the Chinese Nationalist Government for Formosa.

Since 1946 he has been the diligent and efficient chairman of the Society of American Foresters' Committee on International Relations. As such he represented the Society as well as the United States Government at the third World Forestry Congress in Helsinki in 1949, and will be head of the Society's official delegation to the fourth World Forestry Congress to be held in India in December.

Of honors Tom Gill has already received not a few. In addition to having been elected a Fellow of the Society of American Foresters, he is an honorary member of the Society of Mexican Foresters. In 1947 he was awarded the medal *Merite Agricole* by France for his assistance in forming a forestry

unit within the United Nations. In 1953 he was given an honorary doctor's degree together with a gold medal by the University of the Andes in Venezuela.

Dr. Gill, through your understanding of the role of renewable natural resources in raising and maintaining high living standards for people everywhere, through your diligence in promoting education and research leading to more careful conservation of those resources, and through your abiding faith in the ultimate value of international cooperation as a means of attaining good resource management by the nations of the world, you have been an honor to American forestry and an inspiration to your professional colleagues.

Tom Gill, in behalf of the Society of American Foresters it is with great pleasure that I present to you the Sir William Schlich Memorial Medal for distinguished service to forestry.

A Broad Look at Our Resource Problems

Dr. R. G. Gustavson
President, Resources for the Future, Inc.
Washington, D. C.

MAY I EXPRESS my high appreciation for the invitation to speak to this very important section of American citizenry on our resource problems. In doing so I surely am aware of the fact that I am bringing coals to New Castle. In fact, I am probably running one of the major risks of my professional career in exposing my ignorance. I came up through the discipline of biochemistry and the biochemist has been defined as a man who talks biology to chemists, chemistry to biologists and politics when both are in the audience. At the moment, if I can draw any lessons from the current scene, it certainly would not be wise for me to talk politics.

It is common for historians to refer to changes in society as being the result of "movements." Consequently, we speak of the Quaker movement, the abolition movement, the industrial revolution, the western movement, et cetera.

Historically we find that human beings, or at least large sections of them, in the course of time settle down to rather fixed patterns of activities. Slavery, for example, is an institution that has existed over the centuries. In church history many theological positions have become fixed and remain with us over the centuries. The same is true in the field of education where the pattern of limiting education to selected individuals on an economic basis is very much with us even to this day. In the field of resources, and surely in the field of forestry,

DR. REUBEN G. GUSTAVSON, president of Resources for the Future, Inc. the principal speaker at the Society's dinner.

a laissez-faire policy governed our thinking for many centuries. Choosing the finest trees for the shipbuilding industry, when wooden ships sailed the seas in large numbers, devastated forests in Western Europe to such an extent complete recovery is still far in the future.

A second interesting phenomena in human behavior is that sooner or later there is rebellion against the fixed pattern. We think of the development of the anti-slavery movement headed by small groups in various parts of our country which led to war between the States. The reformation in church history to this day is associated with the word "protest." The development of the landgrant college during the administration of Abraham Lincoln was the rebellion against education for the selected few. The turn of the century saw the development of the great conservation movement in our own country under the leadership of President Theodore Roosevelt and Governor Pinchot of Pennsylvania.

Rebellion is always characterized by extremes and so following the rebellion a period of contemplation rules and man finds himself in a period of uncertainty. The terrible economic upheaval which followed the Civil War led many to the conclusion that liberation of the slaves by war was perhaps the simplest part of the problem. The bloody years of conflict in the field of religion certainly led people to ask themselves why more rational procedures were not followed. Once mass education had been established, educators began to ask themselves how do we deal fairly with the basic differences in the mental capacities of men. And this audience knows far better than I the many problems that resulted from the nationalization of tremendous tracts of forest lands.

This period of uncertainty eventually is followed by a period of insight where men, through education and research and discussion in a democratic and civilized society, begin to separate out the many factors of complex problems and evaluate their significance. In speaking of the broader outlook of our resource problems, I should like to feel that we are beginning to find our way into this very important phase of forestry management which we shall call "insight."

Scientists, in general, like to condense their ideas into formulas and equations. The advantage of this

[1]Presented at the banquet, 54th annual meeting, Society of American Foresters, October 27, 1954, Milwaukee, Wis.

kind of expression is that it makes it fairly easy to keep track of the logic of the situation, and so I would like to speak to you to-day about a number of formulas that concern our welfare.

The first formula reads *Gross National Product = Our Standard of Living ÷ Population.* The truth of this equation is self-evident, and so I shall quickly pass on to a second equation, namely, *the gross national product is a function of people, technology and resources.* Let us examine this equation by first examining the factors that become involved when we discuss people. We usually think in terms of numbers, and surely the number problem is a serious one. But now I want to talk about the "quality" factor in people. The number of people who can pierce the curtain of the unknown and lead us into the new areas of thought in any field of endeavor are few in number. As a result, it is possible to write the history of science, for example, in terms of the biographies of an exceedingly small number of men and women.

History gives us some but by and large very, very few examples of men who have pierced this curtain of the unknown with relatively little formal education. I refer to the great Michael Faraday and our own Thomas Edison, to name just two. It is becoming increasingly evident that basic to developing great minds is the opportunity for education, and particularly education at the graduate level. Each generation stands on the shoulders of the past generations and education in a certain sense may be defined as the process of climbing up on those shoulders.

Registration in our graduate schools today is not nearly as large as it should be. Probably a basic reason for this is an economic one. The answer must be found in terms of increasing support of the graduate fellowship program. Here American industry and philanthropic foundations have made a good start, but very much larger contributions are necessary from all sources if this program is to be a success.

Seeking out youngsters who have great native ability is a very important and difficult task. There is every reason to believe that for every boy or girl of ability who finds his or her way into higher education, there remains behind an equally talented boy or girl who never has this opportunity. The Westinghouse talent search is a very fine example of what industry can do to find the young people. The responsibility for encouraging these talented young people to go on with their education rests heavily on the high school teacher. The low high school salaries are not helping to attract this kind of leadership into the high school teaching field.

Every science in its early phases is very largely devoted to description and classification. This work is very important. Biology is a grand example of what I am talking about. However, with the development of chemistry and physics came the opportunity to explore that which is beyond the microscope, and biology is now entering a dynamic phase.

It is my personal opinion that one of the great needs in the field of forestry is to train men in the fundamentals in order that a more basic approach may be made to the problems. Our relatively meager understanding of the problems in forest genetics, forest physiology, and the closely related problem of forest soils are all calling for highly trained individuals. To increase this number of highly trained individuals has to be a part of the broad outlook at our resources. The new techniques of physics and chemistry are giving us the opportunity to solve resource problems which have puzzled us over the decades.

Take some of the basic problems with respect to water, for example. How firm a supply of underground water can we rely upon? How rapidly are underground waters recharged? How long ago was the water now in the ground placed there by nature? These questions so baffling can now be answered by a new technique developed by Dr. Willard Libby of the University of Chicago and reported in a recent meeting of the American Chemical Society. Rain water contains small but definite amounts of the "heaviest of waters" called "tritium water." This water is radioactive and has a half life period of twelve and one-half years. The amount of tritium formed in the upper atmosphere by cosmic ray bombardment is apparently remarkably constant. As soon as this radioactive tritium water is formed it starts falling to the earth in the form of rain and requires fifteen to twenty days for its journey. It now continues to disintegrate and the rate of its disappearance can easily be followed by radioactive techniques. Using these techniques, Dr. Libby has been able to show that some of our underground waters have been there fifty or more years and this means that when we withdraw these waters we are using up a resource which will again require decades to restore. Let me read from Dr. Libby's report.

Water from the 900-foot-deep well at the MacDonald Observatory at Fort Davis, Texas. Sample given by Dr. Gerard Kuiper of Yerkes was pumped in June of 1953 (age greater than 50 years).

Champaign-Urbana city well water. Water taken in July 1953 from well #51, located west of Champaign. This well is 296 feet deep and is producing at a rate of 2225 gallons per minute. The first hundred feet of formation is Wisconsin glacial drift and the next 200 feet are Illinoisan and Kansan drift. The very bottom of the well at 300 feet is at the top of the Pennsylvanian system. Nowhere in the entire log of the well is any clay formation which would prevent the down-seepage of rain. It was therefore thought that perhaps the well could contain some rainwater. It is generally thought that the well water which furnishes the area contains some rainwater. It is generally thought that the well water which supplies the area is ancient and possibly of melted glacier origin. Sample furnished by T. E. Larson, Head, Chemistry Subdivision of the State Water Survey. Tritium analysis showed its age to be greater than 50 years.

Water from the Lardarello, Italy, hot springs, near Pisa. This hot springs furnishes about ¼ of the electric power in the whole of Italy. The water actually was steam from the volcanic fumaroles. It is over 50 years of age.

Water from Lake Mösvan used to supply the Norsk-Hydro. The Lake Mösvan water probably was melted snow from the winter of 1946 and 1947. The water was taken from the lake at the end of January 1948.

Time is the important factor in

a great deal of forestry research. While valuable information with respect to crop plants can be gained in a single year with respect to hybrids the tree geneticist has to have 10-15 or more years. The problem of the effect of the environment is also most important. This suggests that the strategic place for research is to try to decrease the time element involved in arriving at decisions. Testing progeny for growth rate is an example.

A tree, or any plant for that matter, increases in dry matter directly as it accumulates carbon, for carbon is the major component of its cellulose. It accumulates carbon directly as total photosynthesis exceeds total respiration. A fast-growing tree increases in dry matter (accumulates carbon) at a greater rate than does a slow-growing one. The overall photosynthesis must therefore exceed its overall respiration by a greater amount than is true for a slow-growing tree. It seems almost certain that within a population of normal appearing trees there is a range of inheritable photosynthetic capacities. Thus there should be trees which have a high absolute photosynthetic capacity but which appear normal because of a masking high rate of respiration. Also there should be other normal appearing trees which have a low photosynthetic capacity coupled with a low respiration rate. A combination of high photosynthetic capacity with low respiration should yield a tree of exceptionally high net capacity. This may be the explanation for the mysterious heterosis or hybrid vigor. Professor Decker of the College of Forestry of the State University of New York has been working on this problem. Is there any way to evaluate a cross short of watching it for years? The use of the infra-red analyzer now makes possible the determination of carbon dioxide very quickly—a matter of seconds—in varying conditions of light and darkness. Thus we can measure the carbon deposited as celulose very quickly. Of course the problem is not as simple as I have outlined it. It would seem that the phytotron at California Institute of Technology which enables the experimenter with plants to control the environment would offer great opportunities for research along these lines, creating artificial climates, soil conditions, et cetera.

Or to look at another phase of forestry research which needs workers trained in the fundamentals of physics, chemistry, biology, and mathematics. Correspondence that I have had with Professor Mirov of the University of California reveals how little we know about reproduction in the tree. Until recently we knew very little about reproduction in the animal world and there is still much to be learned. Biochemistry has made tremendous strides however. Here is a field that is wide open in the field of forestry but in which progress will be slow unless we can increase the number of highly trained workers with a lively imagination. The work of Dr. Mirov, for example, in answering the question, why is the ponderosa pine so fearfully subject to the ravages of the western pine beetle, whereas another, the Jeffrey pine is not bothered at all. You will remember that Dr. Mirov found that the turpentine of the Jeffrey pine contained a paraffin hydrocarbon, namely normal heptane. The turpentine of the ponderosa pine does not carry heptane and apparently the resistance to the ravages of the western pine beetle is due to the presence of heptane. It has been possible to develop crosses that, while they carry less heptane than the Jeffrey pine, still have enough of the hydrocarbon to resist the beetle. This is a fine example of translating the vague term, "resistance to an insect" to a definite chemical compound. When Michael Faraday was told that chemists had found compounds that had the same number and kinds of atoms but different arrangements to make different compounds he made the remark that "now that we have been taught to look for this phenomena we shall probably find many examples of it." Tonight we can say, "Now that we have been taught to look for definite chemical compounds which give plants their resistance to insects, we shall probably find many examples of this phenomena." The problem, of course, is to develop more men for basic research.

In tracing the rapid diminishment of tung oil from the trees in Florida to the absence of traces of zinc in the soil by means of the spectroscopic, science restored the tung oil industry by the addition of traces of zinc to the soil. The problem of the relation of the composition of the soil to the physiology of the tree is awaiting skillful workers.

Let us now look at the second factor in our equation, namely technology. This is a phase of the work that is your life work. We all recognize that the forests serve many purposes in our complicated economy. They are most important in the conservation of water, in the prevention of soil erosion, in the preservation of wildlife, in the production of the raw material for lumber and paper, in offering an increasing opportunity to an ever increasing number of people for recreation. The work carried on for sustained yields of trees by both government and private industry is one of the most encouraging phases of our national life. The concern over seed selection and all that that means, adaptation to the environment and quality of tree, rate of growth, disease resistance, et cetera, is most encouraging. The work of research laboratories in showing us how to make the best use of the timber that is cut, with the minimum of waste, is remarkable. The development of glues by these same research laboratories has made it possible to make large timbers from smaller ones: glues that are water resistant and with great strength. The encouragement of tree farms with proper supervision is to be highly commended.

And finally let me say this.

A great many people, I suppose, would say that our age is the atomic age. That the great discovery of methods for the liberation of energy by the destruction of matter will stand out as a great mountain peak in the long struggle that man has made to understand and control his environment. Without

doubt this will be true because this discovery ranks with the discovery of fire. I feel, however, that a century from now men will feel that our age will stand out as the age in which men learned to cooperate with one another as individuals and as groups in a community, as regions and as nations. The development of techniques of cooperation is as inevitable as that there should be light following the rising of the sun. There was a time when a Louis Pasteur could wander from the erudite field of crystallography into the field of microbiology and then into the field of disease producing organisms and the most complex field of immunology. This kind of activity belongs to another century. The great discoveries today are the result of team work; our hospitals are made up of teams. The same is true in every form of activity that we engage in. No finer example could be given than the work connected with our forests. The conflicting interests, superficially examined, have to be resolved. Somehow we always learn to cooperate when-some great crisis is upon us such as war. We must learn to cooperate in times of peace. The federal government is aware of the fact that the various agencies must cooperate. The day when we can afford to have the Department of Agriculture, the Department of the Interior, and the Army Engineers pulling in different directions must come to an end. The day when representatives of the federal government in the field of forestry and the lumber and paper and pulp people must work together on common problems is here. The tremendous strides that industry is making in obtaining sustained yields is most encouraging.

We have had the pattern of laissez-faire and it led to revolutionary changes; we have had the period of uncertainty where we were uncertain of our way. The period of insight is here. It must be characterized by fundamental research, by education, by high level technology. All of these will depend on developing a spirit of cooperation which is not dependent on some crisis in human events, but the realization of the basic principle that only in this way can we be sure that we will all gain and that our actions as reviewed by our descendents will be regarded as good standards of conduct for them to follow.

❦❦❦

Addendum

The article by Robert E. Dils, "Status of College Instruction in Forest Influences and Watershed Management," appearing in the October 1954 issue of the JOURNAL (Vol. 52, pages 727-29), fails to list the College of Forestry State University of New York, among forestry schools in the United States offering instruction in forest influences and closely related subjects, although it was indicated that such a course was contemplated at the college.

Subsequent to preparation of the article, but prior to its publication, a course in "Forest and Range Influences" was inaugurated. This course is taught by Dr. Harold G. Wilm and was first offered in January 1954.

Coming Events

Gulf States Section

The annual meeting of the Gulf States Section will be held at the Buena Vista Hotel, Biloxi, Miss., March 26 and 27.

Southern Forest Tree Improvement

January 5-6 at Tulane University, New Orlean, La.

Southern Forestry Conference

The Forest Farmers Association, March 3-4, at the Edgewater Gulf Hotel, Biloxi, Miss.

20th North American Wildlife Conference

The North American Wildlife Conference will hold its 20th meeting March 14-16 in Montreal, Canada. Theme of the meeting will be "Natural Resources Use—A Continental Challenge."

A Method of Thinning and Forecast of Yield in Douglas-Fir[1]

Svend O. Heiberg[2]
and Philip G. Haddock[3]

WITH THE ADVENT of World War II and post-war markets in the Pacific Northwest, accessible young Douglas-fir stands have increased greatly in value. Despite some knowledge of how such stands might be handled, this situation has not resulted in the practice of intensive silviculture on a large share of such lands. However, a number of workers in the region have demonstrated the practicality of thinning young or middle-aged Douglas-fir (*2, 7, 13, 14, 15, 17, 26, 28, 30, 31, 37, 39 40*), and some study has been given to desirable growing stock density (*6, 20, 32*). The question that remains with us and will continue to demand attention is just how should thinnings in young growth be carried out to create the most value in the long run. This question involves what are the advantages of the thinned stand expressed in volume and value over the unthinned stand.

Thinning Theory

A principal purpose of thinning is to bring the stand into a condition to yield the owner the greatest net return in the long run. This objective can not, of course, be reached in one thinning, but must be accomplished through a succession of cuts. Each cut would yield a greater income and the final cut should be considerably better in quality and the individual trees larger in diameter as compared to the trees in an unthinned stand.

It cannot be expected that thinning in itself will increase the production of wood. An unthinned stand probably produces as much organic matter as the same stand would if intensively handled (*21, 22, 23, 24, 33, 34, 36*). However, by thinning, volume that otherwise would deteriorate will be salvaged at least in part and more important, the increment can be placed on the most desirable trees and large dimensions will be produced in a shorter time. Treatment of stands in this manner should greatly increase the financial yield. Income will be gained early and steadily, the total harvested yield will be increased in quantity as well as in quality, and it will be economically possible to grow trees to much larger sizes at an attractive rate of interest where thinnings are applied as compared to unthinned stands.

A Proposed Thinning Schedule

In Douglas-fir that is readily accessible when should thinnings begin, how often should they be repeated, what trees should be favored, what level of wood capital should be maintained and what yields can be expected? In order to get a preliminary answer to these questions, a proposed cutting plan or tentative yield table has been set up (Table 1).

Such a proposed cutting plan or yield forecast is by no means as accurate as empirical yield tables. However, reliable tables based upon actual silvicultural practices in the Douglas-fir region cannot be produced within several decades. Yet foresters must, like architects, produce plans and estimates to work with in order to judge to what extent silvicultural efforts are worthwhile.

[1]Presented at the annual meeting, Society of American Foresters, Colorado Springs, Colo., September, 1953.

[2]Professor and Chairman of Department of Silviculture, College of Forestry, State University of New York, and Walker-Ames Professor of Forestry, University of Washington, Winter Quarter 1952.

[3]Associate Professor of Silviculture, University of British Columbia, formerly Assistant Professor of Silviculture, University of Washington.

TABLE 1.—PROPOSED CUTTING PLAN AND YIELD FORECAST

Const Douglas-Fir
Site Index—150

One Acre

	Remaining stand						Thinning					
Age years	No. of stems	Ave. D.b.h. in.	B. A. sq. ft.	Ave. ht. ft.	Volume Cu. ft.[1]	Bd. ft.[2] Scrib.	No. of stems	Ave. D.b.h. in.	B. A. sq. ft.	Ave. ht. ft.	Volume Cu. ft.[1]	Bd. ft.[2] Scrib.
28	629	5.7	115	59	2,540	.....	106	6.6	25	62	584	.....
31	532	6.4	119	65	3,030	.....	97	7.7	31	69	830	.....
34	436	7.2	123	73	3,430	2,740	96	7.9	34	74	910	1,000
38	339	8.2	127	81	3,890	4,670	97	8.3	34	82	1,040	1,350
42	267	9.5	130	88	4,260	8,090	72	9.5	35	88	1,140	2,170
46	213	10.6	132	94	4,590	11,200	54	10.6	33	94	1,130	2,760
50	171	12.0	134	100	4,870	15,500	42	11.3	29	98	1,070	3,000
55	136	13.7	136	107	5,220	19,800	35	13.4	33	105	1,240	4,590
60	108	15.3	138	114	5,590	24,300	28	14.6	31	112	1,190	5,400
66	85	17.3	139	121	5,930	28,500	23	16.2	33	115	1,330	6,100
72	68	19.4	140	127	6,220	32,300	17	17.7	29	118	1,200	5,880
78	56	21.5	141	133	6,520	35,700	12	19.5	25	122	1,060	5,510
85	47	23.6	142	139	6,830	38,900	9	22.1	24	124	1,030	5,700

[1]Total volume of all living stems inside bark.
[2]Only trees 12 inches at d.b.h. and larger, minimum top diameter 8 inches and scaled in 16 foot logs.

We may assume that volume production in cubic feet of Douglas-fir within limits is not influenced by density of stocking.[4] And furthermore we assume that the lower limit of stocking, as Möller has shown (*21, 22, 23, 24*), is about one-half of the possible cubic foot volume or basal area for the species, site and age in question. It should be possible from available data to construct yield tables that will reflect the most desirable development of the individual trees as well as the stand within the growth potential of Douglas-fir.

For the example chosen, the site index is 150, which corresponds approximately to the average site in the Lee Forest thinnings described below. The heights, adjusted from the height of dominant and codominant trees to the heights of mean trees, were taken from permanent sample plots from the Douglas-fir region as given by Spurr (*25*). The heights of permanent plot trees were believed to reflect the true path of height growth better than harmonized curves. Basal area growth and form factors were taken from European Douglas-fir plots on similar sites (*11, 35*), and conversion ratios on a stand basis for cubic foot to board foot Scribner were taken from standard Douglas-fir yield tables (*19*).

The reduction of stems (Table 1, Fig. 1) has been adjusted to a fast and steady growth of the remaining trees and so that the average tree at no time will grow faster than 6 rings per inch in radius. The rate at d.b.h. shown in the table varies between 7.8 and 6.0 rings per radial inch of the average diameter.

The basal area (Table 1, Fig. 2) is kept fairly low, steadily but slightly increasing from 115 square feet to 142 sq. ft. per acre, after cutting, and is throughout the rotation well over half of the basal area in unthinned stands. The proposed basal area is much lower than generally accepted by foresters and also lower than those recently proposed by Briegleb (*6*). A basal area held to the minimum permissible without loss of growth would, of course, increase the growth rate of the individual trees with a probable loss in quality which is not deemed desirable. Many trees would exceed the six rings per inch radial growth which at present at least is the extreme limit for peeler logs and high quality saw logs (*1, 8, 12*). Furthermore, such a low basal area would not allow for any reserves needed for unexpected damage to the stand.

Relatively short thinning cycles have been used to satisfy a reasonable, even growth and control of quality. In thinning it is exceedingly difficult to judge how heavy the particular thinning ought to be

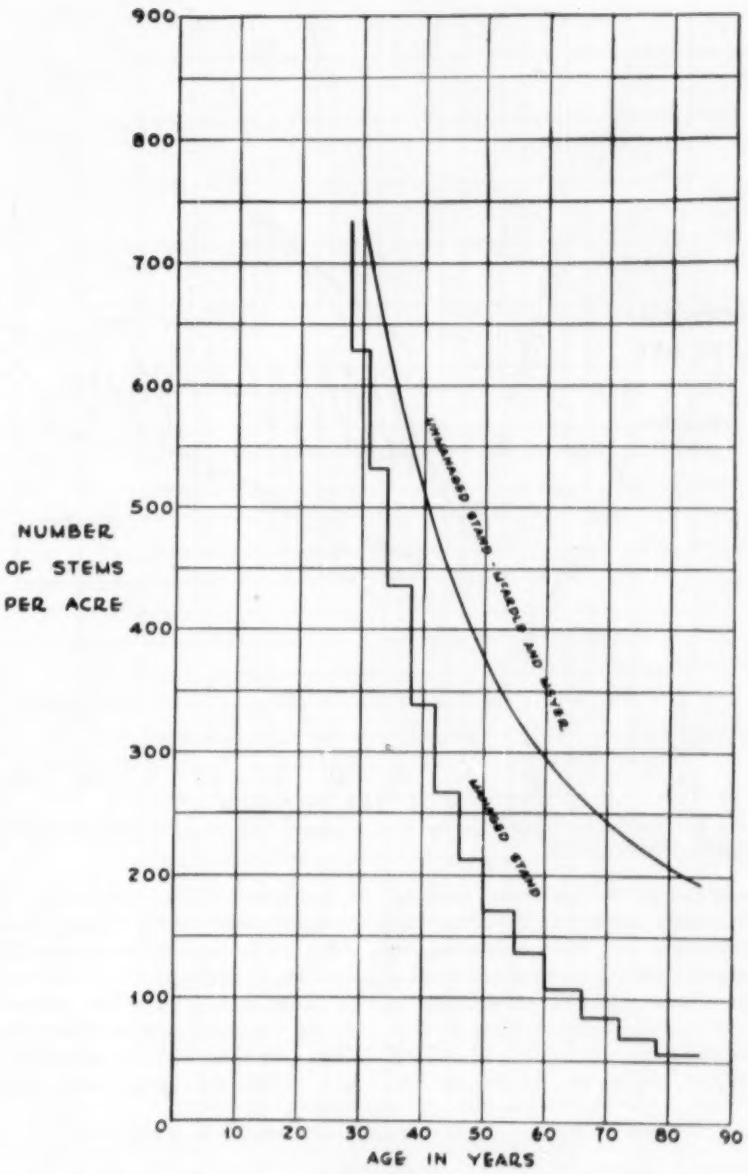


FIG. 1.—Douglas-fir. Number of stems per acre, managed and unmanaged stands. Site index 150.

[4]Indication that this is the case can be seen by the fact that heavy reductions in basal area at Voight Creek, Wash., have not resulted in diminished growth (*30*). As a matter of fact, some of these heavy cuttings, as well as heavy cuttings elsewhere, have sometimes indicated an increase in growth rate. It is, however, likely that this increase is only temporary and that in the long run the growth will be the same for various degrees of cutting (*24, 33*).

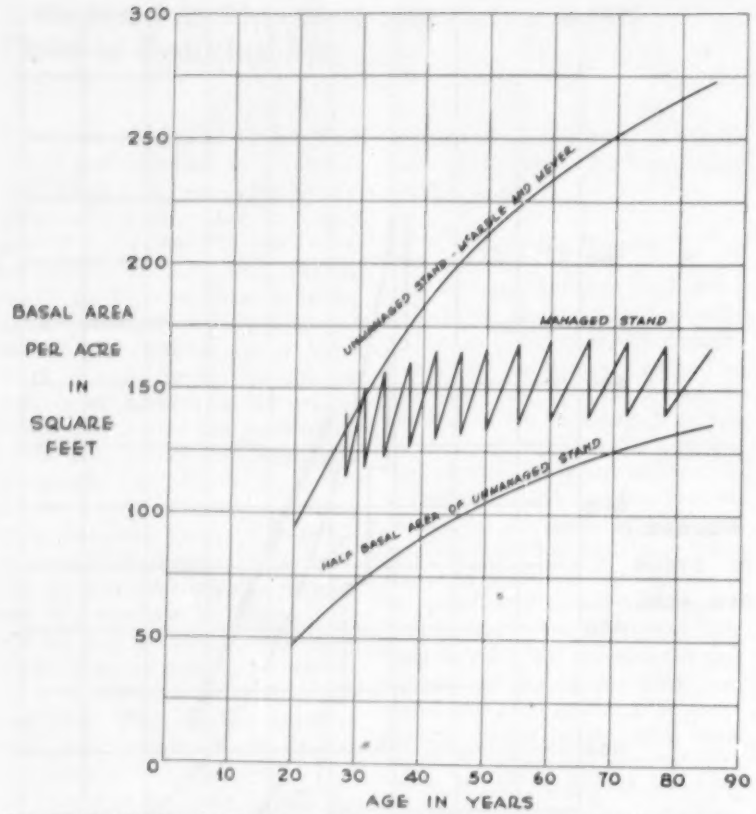


FIG. 2.—Douglas-fir. Basal area per acre in square feet, managed and unmanaged stands. Site index 150.

and what the interval between thinnings should be. Also, it is very expensive and time consuming to acquire reliable experimental data on these matters. According to such experimental evidence as does exist (*2, 3, 4, 5, 14, 15, 16, 21, 22, 23, 24, 28, 30, 33, 34, 37, 39*) the actual loss in volume production is probably very small, if any, provided we do not take more than 25 percent or perhaps 30 percent of the basal area or cubic-foot volume *at one time*, and provided that the basal area is not reduced below one-half of the maximum basal area possible at that age. Volume may be lost through mortality if the cutting intervals are too long. It is, however, primarily quality that is lost by cutting too heavily. Long thinning intervals mean heavy cuts and heavy cuts mean larger limbs on the remaining trees and uneven annual rings. Further, larger limbs mean larger knots and lower grade lumber, and the wider rings mean lower specific gravity and perhaps disqualification for such high-grade products as peeler logs (*8*). The intervals chosen on the yield table appear to give a reasonably even, fast, but not too fast, growth of the individual trees and yet allow enough volume for practical logging on these accessible sites under consideration.

The intervals have been increased with increasing age, since the stand has a greater capacity for growth at the younger ages and the development for quality should primarily be done in youth. It will be seen in Table 1 and Figures 3 and 4 that the volume has been kept fairly low throughout the rotation. This has been done in order to place the increment on the best trees and to allow these to reach large sizes in the shortest possible time without impairing quality. In other words we are striving to provide for the desired even development of a growing stock capital of relatively low volume which is forced by careful thinning to produce the largest volume possible of higher quality wood.

It may also be noted in Table 1 and in Figure 5 that the trees cut at the early thinnings are larger than the trees remaining while the reverse is true at the later thinnings. That is, in the early stages a selection type of thinning should be conducted, gradually changing into crown thinning. Marking should always be done to favor the trees which appear to have the best potential development. In the younger stands such trees are to a great extent to be found among the lower codominants and upper intermediate crown classes. Douglas-fir stands do not all originate from a single seed year and initial differentiation into crown classes does

TABLE 2.—DOUGLAS-FIR: LEE FOREST—UNIVERSITY OF WASHINGTON

Age: 53 years		Comp. No. 4 Site index 154			One acre
	Species	Before cut	Cut	Percent cut	After cut
Av. d.b.h. inches	Douglas-fir	12.5	14.2	.....	12.0
	Misel. species	8.7	10.1	.....	8.6
	All species	11.3	12.4	.....	10.9
Ave. height ft.	Douglas-fir	94	98	.....	93
Live crown ratio	Douglas-fir	47	53	.....	45
No. of stems	Douglas-fir	159	36	22.6	123
	Misel. species	96	24	25.0	72
	Total	255	60	23.5	195
Basal area sq. ft.	Douglas-fir	137	38	27.7	99
	Misel. species	40	11	27.5	29
	Total	177	49	27.7	128
Volume cu. ft.	Douglas-fir	5,347	1,525	28.5	3,822
	Misel. species	1,213	388	31.0	825
	Total	6,560	1,913	29.3	4,647
Volume bd. ft.	Douglas-fir	20,141	6,202	30.8	13,939
Scribner	Misel. species	3,599	1,366	25.4	2,233
	Total	23,740	7,568	31.9	16,172

Cut February 1952

Miscellaneous species: W. hemlock, W. redcedar, Red alder and Bigleaf maple.

not necessarily indicate inherently lower growth vigor of the trees in the lower crown class, nor are we certain that a tree showing early vigor will continue to do so. As the thinnings progress, these best formed trees will gradually become the leading trees and it is most likely that many of them will be retained for the final crop. Where stand conditions such as stocking, spacing, and crown volumes of the lower crown classes permit, the cutting of the largest and most "wolfy" trees, or rough dominants, in the early cuttings is desirable and should help to solve the difficult marketing problem that generally exists during the early stages.

Table 1 has been extended only up to 85 years. At present it is, of course, difficult to estimate what the rotation age or size should be. Preliminary economic considerations, as shown below, indicate, however, that the rotation will not be extended beyond that age.

Thinning at Lee Forest[5]

In an attempt to put some of these theories into practice, a first thinning was made in the late winter of 1952 at the Lee Forest, about 20 miles north of Seattle, Wash., in Snohomish County. This property of 158 acres of young Douglas-fir and associated species was donated to the University of Washington in 1933 for use by the College of Forestry as a demonstration and research forest. It is typical of many areas readily accessible by road and topographically well suited to intensive forest management. Site quality averages around site index 150 for Douglas-fir, and stocking and age classes vary as a result of logging and fires between 1893 and 1915 (*27, 29*).

Logging of the trees marked for thinning was carried out by two experienced local contract loggers in the portion of the forest supporting 50 year old timber. Approximately 134 M bd. ft. Scribner Rule were cut from 20 acres of forest. The equipment used consisted of a Titan one-man power saw and a John Deere crawler-type tractor with a five foot blade and winch. The returns for the logs at the landing were $36.00 per M and the loggers were paid $21.00 per M, yielding $15.00 per M for stumpage and overhead. Data from this thinning based on 13.5 acres are given in Table 2.

The timber marking for the thinning and the time studies of the logging operation were carried out by College of Forestry senior and graduate students in silviculture under the direction of the authors, in cooperation with other staff

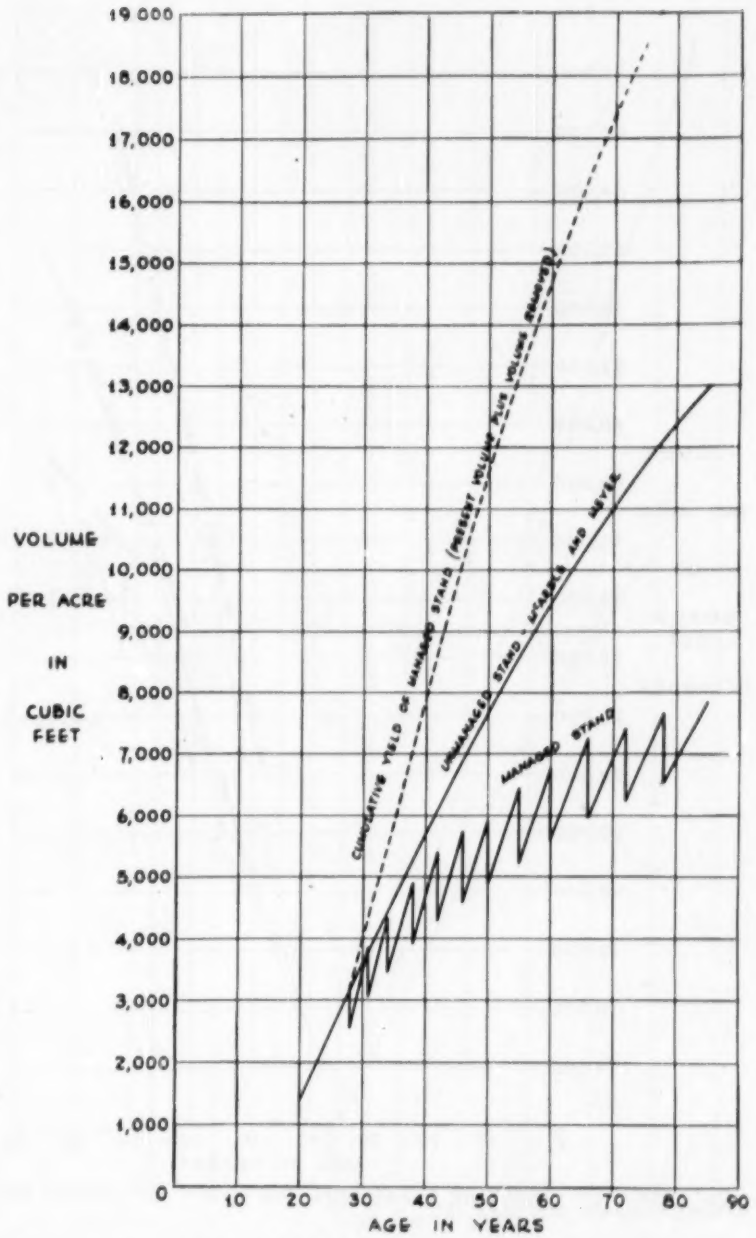


FIG. 3.—Douglas-fir. Volume per acre in cubic feet, managed and unmanaged stands. Site index 150.

[5]The authors wish to acknowledge the interest and assistance in various phases of the Lee Forest thinning of the following: students and staff, College of Forestry, University of Washington; Soil Conservation Service; U. S. Forest Service; and the Industrial Forestry Association.

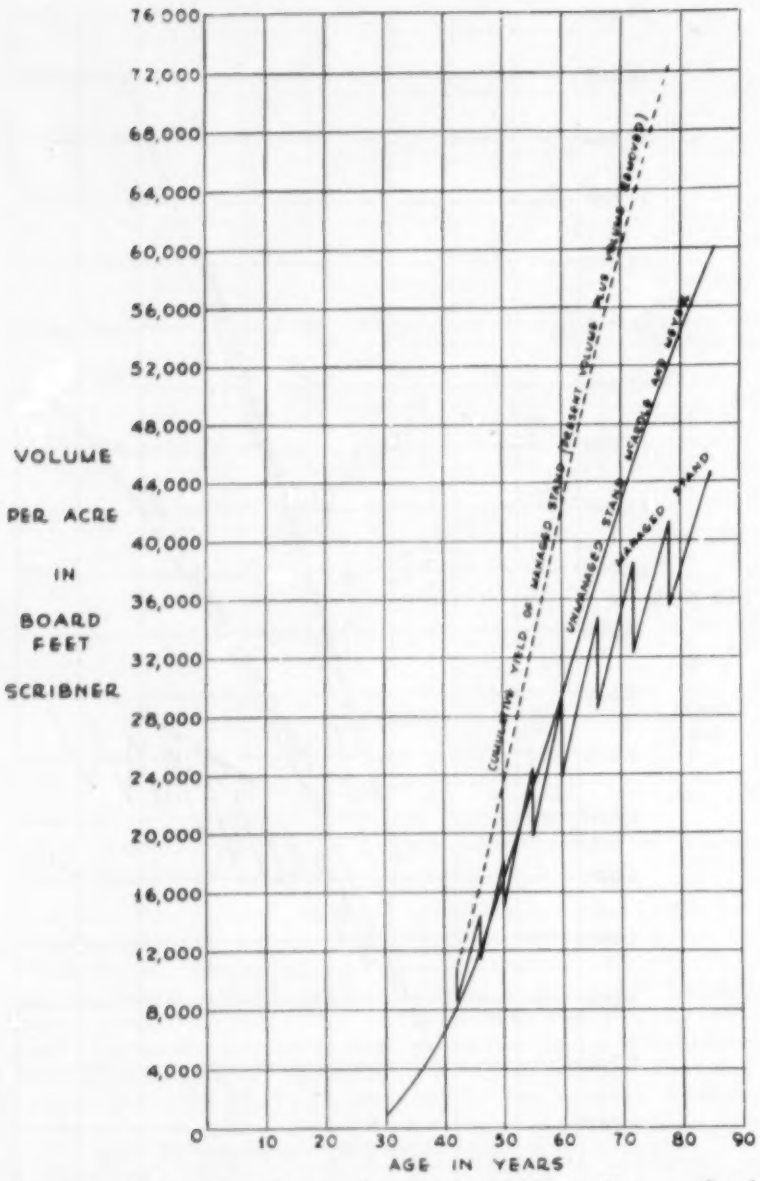


FIG. 4.—Douglas-fir. Volume per acre in board feet, Scribner rule, managed and unmanaged stands. Site index 150.

members of the University of Washington. Close to 36 M bd. ft. Scribner of the 50-year-old timber were sawn by contract for a lumber grade study, using a Jackson Harvester set up at the log landing. In the 30-year-old timber, about an acre was thinned by the students and selected trees were pruned to eighteen feet.

In the 50-year-old stand at Lee Forest, the problems involved are in some respects similar to thinnings at earlier ages. Much space is taken up by large, fast-growing coarse-limbed trees that will, for the most part, produce low grade lumber. These were cut provided there were neighboring trees present that were judged capable of taking over the added growing space. In the young stand, twenty or thirty years of age, this is usually the case. Even intermediate trees are able to recover quickly. In the middle aged stand, however, many intermediate trees appear to be so retarded that early recovery is doubtful. Here codominants appear to be the most reliable trees to leave for future quality growth. Trees which, judging by external appearances, are infected with root rot caused by *Poria weirii* Murr. will have to be taken, which makes the cuttings somewhat uneven. However, the main objective was to leave and favor as many of the well-formed small-limbed leading trees as possible and maintain or create on these trees a crown ratio of about 45 to 55 percent which probably corresponds to a growth rate of six or seven rings per radial inch. As mentioned above, this rate has been considered optimum. At this age, the diameter was therefore lowered (see Table 2) in contrast to the condition which will likely prevail in stands that have already been thinned several times. Here the diameter after cutting may be left as it was prior to the thinning or raised slightly because most of the coarse trees will have already been removed. In the 50-year-old stand at Lee Forest, it is likely that such a modification between selective thinning and crown thinning will have to be practiced at several of the forthcoming thinnings.

It will be desirable, especially in dense stands, to make one or more weedings or cleanings when the stand is only 20 to 30 feet tall, together with pruning. Such expenditures may be excellent investments when the overall financial picture of the stand is considered. Also, early thinnings should be made where only a part of the cut is merchantable. Unmerchantable trees marked for cutting could be girdled or poisoned. However, as the market for small Douglas-fir improves, it should be possible to make early profitable thinnings or at least break even. Such a thinning was made experimentally at Lee Forest in a 30-year-old stand yielding the data shown in Table 3. In these early thinnings, the importance of working for quality is paramount. Wolf trees should be removed, but only if good replacements are present. The objective to aim for in crown ratio should probably be 40 or 45, rather

than 50 or 55 percent. At this age, as well as later, overtopped trees or the lower intermediate trees should seldom be removed. They serve often as good trainers for the leading trees. If their function as trainers is passed, and they can be sold at a profit, they should be cut. The benefit to the stand of cutting such trees except perhaps on the lowest sites is likely to be very small. It is in the general crown canopy that the main thinning should be conducted.

The objective of such a thinning as outlined is to convert the stand into, or maintain it as, the best possible business venture for the owner. At the present time no one can state exactly how this should be done because extraction methods and marketing opportunities will change during the life of the stand and will vary from place to place.

Value Increment Chart

In connection with the thinning in the 50-year-old stand at Lee Forest, a value (or economic) increment chart was made. This is based on a relatively small amount of data. About 35 M bd. ft. were involved, with the trees studied ranging in diameter from 10 to 28 inches d.b.h. Felling, bucking and skidding were timed for every tree and log and the logs were sold, as mentioned above, at $36.00 per M at the landing. On the basis of the volumetric and economic data gathered a value increment chart was made (*9, 10*). It will be seen from this chart (Table 4) that if about 4 percent is the minimum interest that the trees should earn and if about six rings per radial inch is the greatest rate at which the trees should be permitted to grow, they cannot be held to more than about 22 or 23 inches d.b.h. This size corresponds to about 80 or 85-years on the proposed yield table (Table 1). In this chart (Table 4) increase in value over diameters is due not only to increase in the volume, but also to cheaper handling of larger trees (*18, 38, 40*). The values are based on the kind of trees found in today's natural unmanaged forest.

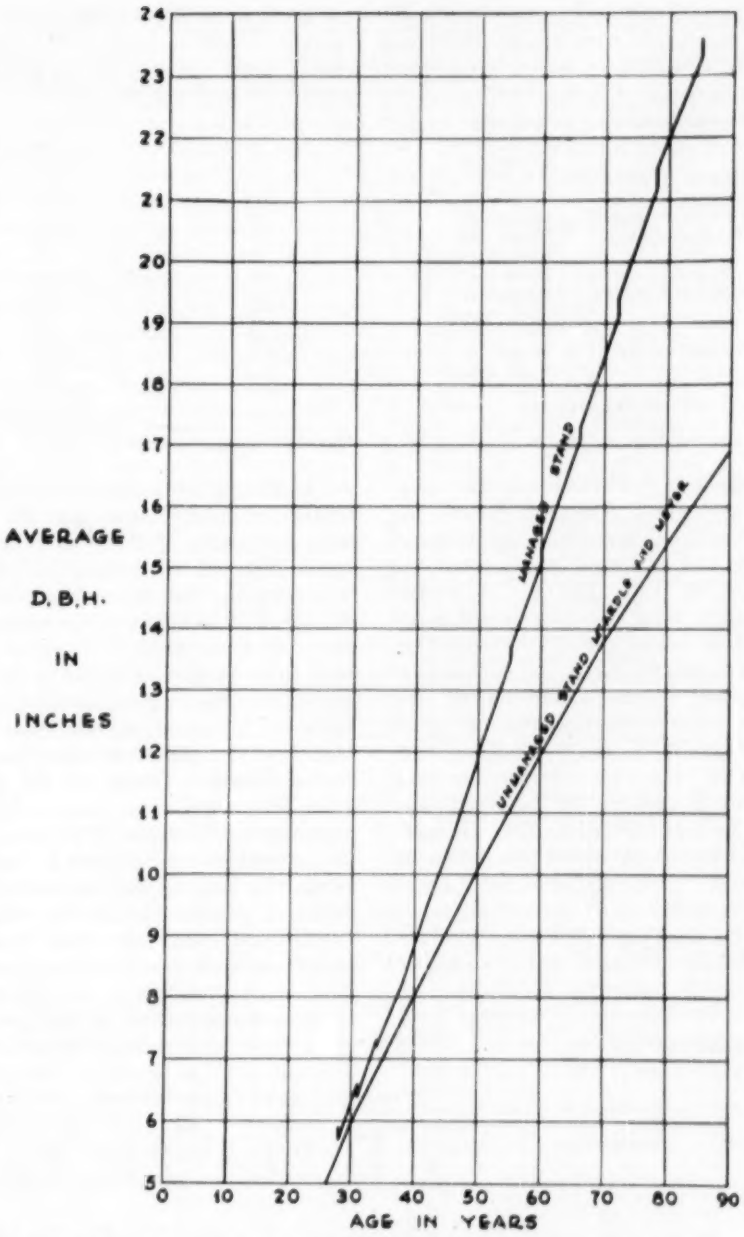


FIG. 5—Douglas-fir. Average d.b.h., managed and unmanaged stands. Site index 150.

Trees grown in stands treated by repeated thinnings should be of better quality, especially toward the end of the rotation. Many peeler logs should be found and the percentage of better lumber grades should be greatly increased. This will of course influence the increment chart and probably shorten rather than lengthen the financial rotation.

Volume and Economic Summary

If we dare consider the proposed thinning plan or yield forecast as outlined and compare the results with those of the standard yield table (*19*) for unmanaged stands on a similar site we get the following comparisons (Table 5). At age 85 the unmanaged stand will have an average d.b.h. of 16.2 inches as

TABLE 3.—DOUGLAS-FIR: LEE FOREST—UNIVERSITY OF WASHINGTON

Age: 30 years	Species	Comp. 2 A Site index 150 Before cut	Cut	Percent cut	One acre After cut
Av. d.b.h. inches	Douglas-fir	7.4	9.1	.....	7.1
	Misel. species	6.0	7.2	.....	5.6
	All species	7.2	9.0	.....	6.9
Height of av. Douglas-fir feet	Douglas-fir	69	74	.....	67
Live crown ratio %	Douglas-fir	.....	35	.....	.....
Number of stems	Douglas-fir	393	49	12.5	344
	Misel. species	79	19	24.1	60
	Total	472	68	14.4	404
Basal area sq. ft.	Douglas-fir	117	25	21.3	92
	Misel. species	15	5	33.3	10
	Total	132	30	22.7	102
Volume cu. ft.	Douglas-fir	4,360	835	19.1	3,525
	Misel. species	530	214	40.0	316
	Total	4,890	1,049	21.4	3,841

Cut made February 1952

Miscellaneous species: W. hemlock, W. redcedar, Red alder and Bigleaf maple.

against 23.6 inches in the managed stand. The total volume produced per acre including thinnings in the managed stand should be 20,584 cubic feet or 59 percent more than the unmanaged stand final volume or 12,950 cubic feet. In board feet, the unmanaged stand shows 59,200 board feet Scribner, counting trees above 12 inches d.b.h. and 8 inches top diameter only. In contrast, the final cut figures for the managed stand show 44,600 board feet. However, the total harvested board foot figures for the managed stand should be 82,360 or 39 percent more. Of the total board foot yield produced in the managed stand 46 percent should come from thinnings.

Furthermore, if we want to get a glimpse of the financial picture and as Example 1, award $10.00 to $20.00 per M bd. ft. stumpage linearly distributed for the average stand diameter 7 inches to 24 inches, we find that the unmanaged forest will yield $918 per acre while the total money yield for the managed forest should be $1,418 or 54 percent more. (See Example 1, Table 5.) It can be expected, however, that the quality of the trees in the managed forest will be a great deal better than that in the unmanaged. Throughout the rotation, the objective has been to develop the best formed and fine-limbed trees, and the growth rate (number of rings per inch) has been controlled. Furthermore, logging in a stand that has been thinned several times is cheaper than in a wild stand. It would therefore be reasonable to expect that a higher stumpage value can be realized from managed stands as compared to unmanaged.

It is also of great economic importance that income will be secured earlier in the managed stand than in the unmanaged and that the managed stand can be held to much larger sizes and better quality than the trees in the unmanaged stand.

In Table 5, Examples 2, 3, and 4, higher stumpage has been assigned the managed stand due to the assumed better quality. In Example 3 all values have been carried with 4 percent compound interest to 85 years and in Example 4, in addition, an assumed investment of $75 for stand improvement has been taken into account. These hypothetical examples further strengthen the case for thinning.

In these examples, income from products such as poles and pulpwood has not been included and it must be remembered that the examples include the utilization of only a fraction of the wood actually produced.

Skeptics and the more conservative minded will perhaps rightly claim that the lack of documented cost data for the thinning of young stands, and the failure to include precise values for current extra expenses for management such as added costs of administration, marking, depreciation, interest and

TABLE 4.—DOUGLAS-FIR VALUE INCREMENT CHART,[1] LEE FOREST, MALTBY, WASH.

D.b.h. in.	Stump value ¢	2% R	2% E ¢	3% R	3% E ¢	4% R	4% E ¢	5% R	5% E ¢	6% R	6% E ¢	7% R	7% E ¢	8% R	8% E ¢	9% R	9% E ¢	10% R	10% E ¢
10	.00																		
11	.55	X		X		X		X		28	5	24	6	22	7	20	8	18	9
12	1.15	X		X		28	6	22	8	18	9	16	11	14	12	12	14	11	15
13	1.90	X		26	9	20	11	16	14	14	17	12	20	10	23	9	25	8	29
14	2.80	X		22	10	16	13	12	17	10	20	9	23	8	27	7	30	6	33
15	3.85	26	9	18	13	14	18	10	22	8	27	6	31	6	35	6	40	5	44
16	5.00	24	11	16	17	12	23	10	28	8	34	6	40	6	45	5	51	4	57
17	6.30	22	14	14	21	11	28	10	35	8	42	6	49	6	56	5	63	4	71
18	7.80	18	17	12	26	10	34	8	43	6	51	5	60	4	68	4	77	4	85
19	9.35	16	20	10	30	8	40	6	50	5	61	4	71	4	81	4	91	3	101
20	10.95	14	24	10	35	8	47	6	59	5	71	4	82	4	94	3	108	3	118
21	12.60	12	27	8	40	6	54	5	62	4	81	4	94	3	108	3	121	2	134
22	14.30	10	30	7	45	6	60	4	75	4	90	3	105	3	120	2	135	2	150
23	15.85	10	34	6	51	5	68	4	85	3	101	3	118	2	135	2	152	2	169
24	17.95	10	37	6	56	5	74	4	93	3	111	3	130	2	148	2	167	2	185
25	19.15	9	40	6	60	4	80	4	100	3	120	2	140	2	160	2	180	2	200
26	20.85	8	43	6	65	4	87	3	108	3	130	2	152	2	174	2	195	2	217
27	22.60																		

R—Number of rings per radial inch. X—More than 30 rings per radial inch.

E—Annual earnings per tree.

[1]Based on sales of sawlogs at landing at $36/M.

upkeep on permanent investments such as roads, make it unwise to theorize too extensively. But these data are bound to vary extremely between different ownerships and operations. Evidence of failure to realize the potentials which can reasonably be expected from well managed young Douglas-fir in the Pacific Northwest are the large areas of overcut and mismanaged or unmanaged lands still evident on some rather extensive areas of very accessible high site forest properties. It is obvious that too few are aware of the potential productivity of Douglas-fir. That stumpage values are much higher where old skid roads and county or farm roads exist should be obvious, and conversely the immediate financial picture will naturally be less attractive where, for one reason or another, thinnings are expected to carry a major share of road construction costs. Likewise, one must admit that not all land assessment and tax questions are completely and uniformly favorable.

Summary

A proposed cutting schedule and yield forecast is presented for young Douglas-fir stands favorably situated on good sites subjected to moderate and frequent thinning. Based on experience with intensive management of Douglas-fir in Europe and on data from experimental plots and initial commercial thinnings in the Pacific Northwest, this forecast and cutting schedule emphasizes the results of maintaining thrifty growth on the best trees which comprise a relatively small growing stock. Data illustrating the principles involved are presented from a first thinning carried out in a readily accessible 50-year-old Douglas-fir stand in Snohomish Co., Wash. During this operation, a value increment chart was made in conjunction with a study of logging costs in the thinning described. This chart indicates that if about four percent is the minimum interest that the trees should earn and if about six rings per radial inch is the greatest rate at which trees should be permitted to grow, they cannot be held to an average diameter of the stand of more than about 22 or 23 inches d.b.h. According to the proposed cutting and yield forecast given this corresponds to a rotation age of about 80 to 85 years for site index 150.

It is indicated that a forest managed as suggested could be expected to yield about 39 percent more in total board feet volume and about 54 percent more in value than an unmanaged stand during an 85 year rotation. If certain other assumptions are made with respect to an expected higher quality of timber produced, and the value of an early and steady income expressed as greater interest earnings on a lower capital investment in growing stock, and easier logging conditions in the managed stand, then much greater increases in total money yield for managed stands could be demonstrated.

It is concluded that proper thinning of readily accessible young Douglas-fir stands in the Pacific Northwest should earn the owner much more in the long run than premature liquidation by clearcutting or high-grading and also more than the mere growing of an unthinned stand to maturity.

Literature Cited

1. ALEXANDER, J. B. 1950. The physical and mechanical properties of second-growth Douglas-fir. ASTM Bul. 169: 33-38, October 1950.
2. BAISINGER, DONALD H., C. H. WILLISON, JR., and ROBERT C. LINDSAY. 1950-53. Unpublished manuscripts, data and discussions on thinnings on tree farms of the Crown Zellerbach Corporation in Oregon and Washington.
3. BAKER, F. S. 1950. Principles of silviculture. McGraw-Hill Book Company, New York.
4. ————. 1953. Stand density and growth. Jour. Forestry 51: 95-97.
5. BECKING, J. H. 1952. De Economie van een sterke dunning voor de Douglas (with a summary: The economy of heavy thinning in Douglas-fir plantations.) Overgedrukt uit: Nederlandsch Boschbouw-Tijdschrift, 24 (10): 257-269.
6. BRIEGLEB, PHILIP A. 1952. An approach to density mensurement in Douglas-fir. Jour. Forestry 50: 529-536.
7. DOUGLAS-FIR SECOND GROWTH MANAGEMENT COMMITTEE. 1947. Management of second-growth forests in the Douglas-fir region. Pacific Northwest Forest and Range Exp. Sta., Portland, Ore. Processed.
8. FLEISCHER, H. O. 1949. The suitability of second-growth Douglas-fir logs for veneer. Jour. Forestry 47: 533-537.
9. HEIBERG, SVEND O. 1942. Cutting based upon economic increment. Jour. Forestry 40: 640-651.
10. ————. 1945. Does economic cutting pay? Jour. Forestry 43: 109-112.
11. HOLM, FOLKE. 1940. Douglasgran, Proveniens og Vaekst. Det forstlige forsogsvaesen i Danmark. 15: 233-312.
12. HUGHES, WALTER G., and JOHN W.

TABLE 5.—SUMMARY OF DOUGLAS-FIR PRODUCTION FROM UNMANAGED AND MANAGED STANDS

Site index 150
One Acre

	Thinning					Final cut					Total yield				
	Vol. cu. ft.	Vol. bd. ft. Scribner	Returns in dollars Example 1	Example 2	Example 3	Vol. cu. ft.	Vol. bd. ft. Scribner	Returns in dollars Example 1	Example 2	Vol. cu. ft.	Vol. bd. ft. Scribner	Example 1	Returns in dollars Example 2	Example 3	Example 4
Unmanaged	...	...	...	...	...	12,950	59,200	918	918	12,950	59,200	918	918	918	918
Managed	12,724	37,760	542	876	2254	7860	44,600	876	1738	20,584	82,360	1418	2614	3994	3034
Managed in % of unmana.	...	...	...	...	...	61%	75%	95%	189%	159%	139%	154%	285%	435%	331%

Example 1: $10 to $20 per M bd. ft. stumpage linearly distributed from 7 in. dbh to 24 in. dbh and applied to both unmanaged and managed stand.

Example 2: $10 to $20 per M ft. distributed to unmanaged stand and $10 to $40 distributed in same manner to managed stand.

Example 3: As 2 but all values carried with 4 percent compound interest to age 85 years.

Example 4: As 3 and a $75 investment for stand improvement (weeding, girdling, pruning) made at age 20 years, carried with 4 percent compound interest to age 85 years and subtracted from total returns.

ALLEN. 1949. Some strength properties of second-growth Douglas-fir grown in western Washington. Unpublished thesis, Univ. of Washington, Seattle, Wash.

13. ISAAC, LEO A. 1949. Recent development in silvicultural practices in the Douglas-fir region. Jour. Forestry 47: 957-960.
14. JOERGENSEN, CHRISTIAN. 1951. Experimental thinning operations on a commercial scale. Forestry Chronicle 27: 64-72.
15. ————. 1952. A commercial thinning experiment in Douglas-fir. Research Notes No. 22. British Columbia Forest Service. Victoria, B.C.
16. MATSON, E. E. 1948. Memorandum of discussion with Flemming Juncker regarding young growth management of Douglas-fir and Sitka spruce in Denmark. Mimeo., Pacific Northwest Forest and Range Expt. Stn., Portland, Ore.
17. ————, and HAROLD A. RAPRAEGER. 1950. Fall Creek second-growth Douglas-fir thinning study. Res. Note No. 70. Pacific Northwest Forest and Range Expt. Sta. Portland, Ore.
18. MATSON, E. E. 1952. Lumber grades from young growth Douglas-fir. Pacific Northwest Forest and Range Expt. Sta. Res. Note No. 79.
19. MCARDLE, RICHARD E., WALTER H. MEYER, and DONALD BRUCE. 1930, 1949. The yield of Douglas-fir in the Pacific Northwest. U. S. Dept. Agric. Tech. Bul. No. 201. Revised.
20. MEYER, WALTER H. 1931. Thinning experiments in young Douglas-fir. Jour. Agric. Res. 43: 537-546.
21. MÖLLER, CARL MAR. 1945. Untersuchungen über Laubmenge, Stoffverlust und Stoffproduktion des Waldes. Det forstl. Forsogsv. i Danmark Vol. XVII.
22. ————. 1947. The effect of thinning, age, and site on foliage increment, and loss of dry matter. Jour. Forestry 45: 393-404.
23. ———— and ERIK HOLMSGAARD. 1947. Staerk hugst, svag hugst og hugst fra toppen. (Crown thinning, low thinning, and selection thinning.) An experiment in Norway spruce. Saertryk af Dansk Skovforenings Tidsskrift. 393-445.
24. ————, J. ABELL, T. JAGD, and F. JUNCKER. 1954. Thinning problems and practices in Denmark. State Univ. of N. Y. Coll. of For. Tech. Bul. No. 76.
25. SPURR, STEPHEN H. 1952. Forest inventory. The Ronald Press Co. New York.
26. STEELE, ROBERT W. 1948. Light thinning in century old Douglas-fir. Pacific Northwest Forest and Range Expt. Sta. Res. Note No. 43.
27. TINNEY, WILLIAM A. 1947. Report on Lee Forest. Unpublished manuscript, College of Forestry, Univ. of Washington, Seattle.
28. ———— and DONALD B. MALMBERG. 1948. Tree management and marking rules, second growth Douglas-fir. College of Forestry, Univ. of Washington and Skagit Forest Council, Sedro Wooley, Wash.
29. TWEDDAL, MELVIN PEDER. 1936. A development plan of the Lee Forest. MF thesis, College of Forestry, University of Washington, Seattle.
30. U. S. DEPT. AGRIC., FOREST SERVICE. 1953. Annual Report—1952. Pacific Northwest Forest and Range Expt. Sta. p. 30.
31. WARRACK, GEORGE. 1948. Thinning and pruning of second-growth Douglas-fir in the coastal region of British Columbia. Res. Note No. 13. British Columbia Forest Service, Victoria, B. C.
32. ————. 1952. Comparative observations of the changes in classes in a thinned and natural stand of immature Douglas-fir. Forestry Chronicle 28: 46-56.
33. WIEDEMANN, EILHARD. 1932. Die Rotbuche 1931 Hannover.
34. ————. 1937. Die Fichte 1936 Hannover.
35. ————, 1949. Ertragstafeln der wichtigsten Holzarten. Verlag M & H. Schaper, Hannover.
36. ————. 1951. Ertragskundliche und waldbauliche Grundlagen der Forstwirtschaft. J. D. Sauerlander's Verlag, Frankfurt am Main.
37. WINN, JACK, GARRETT EDDY, and PHILIP G. HADDOCK. 1949-53. Experimental and commercial thinnings in Douglas-fir on the Blakely Tree Farm. Unpublished reports, Port Blakely Mill Company, Seattle, Wash.
38. WORTHINGTON, NORMAN P. 1949. Lumber grade recovery and milling costs. The Timberman 50: 58-66.
39. ————, and LEO A. ISAAC. 1952. Experimental thinnings in young Douglas-fir. Northwest Science. 26: 1-9.
40. ————, and ELMER W. SHAW. 1952. Cost of thinning young Douglas-fir. The Timberman 53: 136-138.

Remission of Back Dues

To stimulate reinstatement of Society membership the Council, at its meeting in Milwaukee on October 24, 1954 voted to remit the payment of back dues of any former member who applies for reinstatement during the period November 1, 1954-December 31, 1955. Thus a member whose membership was terminated for arrears in dues may apply for reinstatement without the payment of any arrears, provided he makes such application before the end of 1955.

Determining the Direction of Destructive Winds in a Rocky Mountain Timber Stand[1]

Robert R. Alexander and Jesse H. Buell

Foresters, Rocky Mountain Forest & Range Experiment Station[2]

WIND IS ONE OF the most destructive natural agencies in cut-over lodgepole pine and Engelmann spruce forests of the central Rocky Mountain region. Studies on the Fraser Experimental Forest in Colorado have shown that, during a 12-year period following lodgepole pine harvest cuttings, 71 percent of the mortality was the result of wind action. The amount of windfall varied directly with the severity of cutting, but irrespective of severity, windfall was the greatest cause of mortality. In the spruce-fir type, windfall losses for a 4-year period after logging varied from 50 to 140 board feet per acre per year, depending on the intensity of cutting (*6*).

Alternate-strip clearcutting shows promise as a system which will reduce windfall losses. In its application proper orientation of the strips relative to the direction of the destructive winds is important. The difficulty is to determine this direction.

Past Work

Is the direction of destructive winds affected by topography? Literature reporting the results of studies outside of the Rocky Mountain region is noteworthy for a lack of consistency. An intensive study of windfall in selection cutting of ponderosa pine in Oregon showed that local topography did not have a marked influence on wind damage, but losses were higher on ridges and lee slopes (*7*). Studies of virgin Douglas-fir stands in Washington indicated that the danger of windfall was little affected by topography or slope except where the slopes were very steep (*1*). In selection cuttings of ponderosa pine in California and Oregon, the most severe windfall damage was caused at the end of the valleys where a "funneling" of air currents occurred (*9, 10*). Studies of wind damage in white and Scotch pine stands in New England indicated that the behaviour of the wind was extremely erratic, but local topography had a pronounced influence on wind direction, reflecting the results of recent work in Germany which found that topography and slope had a marked effect on wind behavior and direction, causing the wind to shift as much as 90 degrees in direction (*2*). This latter work further indicated that the destructive winds always follow the valleys.

Studies on timber-mortality strips established in the Rocky Mountains of Colorado and Wyoming in the early 1940's indicate prevailing southwest and west winds are modified by local topography so that most of the trees fell approximately at right angles to the slope. From these studies, recommendations were made that strips should run normal to the drainage in mountainous terrain and in a northwesterly to southeasterly direction in flat mesa country (*3, 5*).

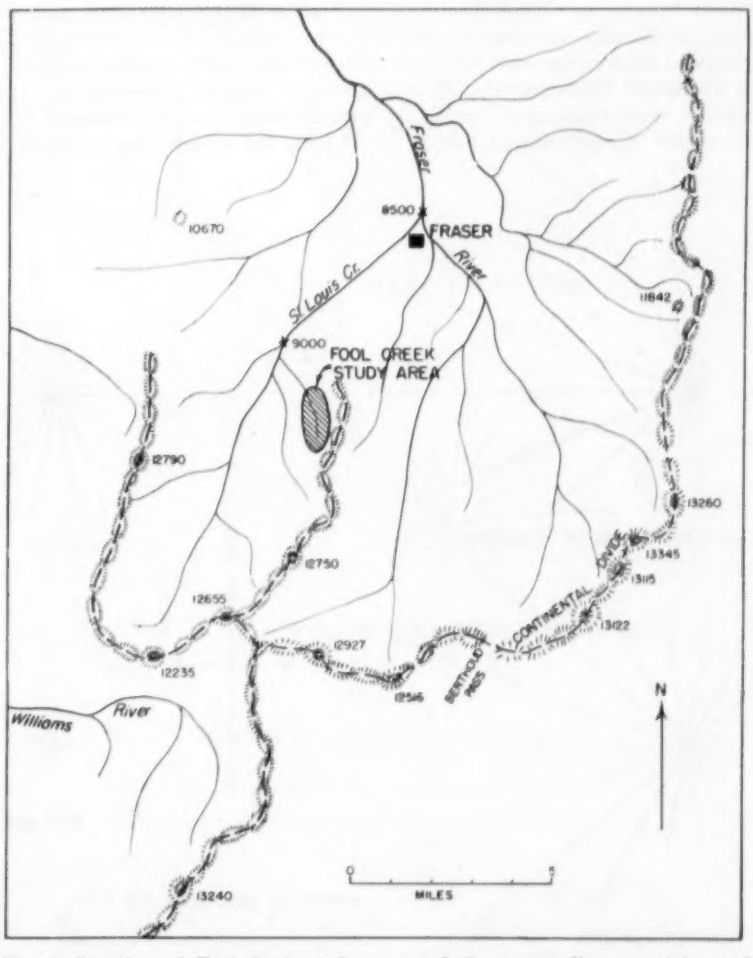


FIG. 1—Location of Fool Creek study area and the surrounding mountains and streams.

[1]The study reported upon here was planned and started by Bert Lexen and R. J. Boyd, Jr. Joye E. Davis made the statistical analyses.

[2]Maintained by U. S. Department of Agriculture, Forest Service, with headquarters at Colorado A & M College, Fort Collins, Colo.

At the Fraser Experimental Forest, studies of four exposures within a radius of three miles of headquarters gave support to the contention that the direction of the prevailing winds may be modified by local topography. These four areas showed a variation in excess of 90 degrees in destructive wind direction (W., S. 45°W., S. 10°W., N. 45°W.).

The Problem

An accurate record of *destructive* wind direction would be much more valuable for strip orientation, when preparing a watershed for logging by alternate-strip clear-cutting, than a knowledge of the direction of *prevailing* wind.

When plans were begun for the logging of the Fool Creek watershed on the Fraser Experimental Forest by alternate-strip clear-cutting, it became imperative that questions concerning wind behavior be answered. Consequently, an intensive study was undertaken to determine the pattern of destructive windflow in this watershed, and to develop techniques and methods useful elsewhere.

Description of the Area

The Fraser Experimental Forest, part of the Arapaho National Forest, is located near Fraser, Colorado, just west of the Continental Divide. Topography surrounding the Fool Creek study area is shown in Figure 1. The watershed is a 714-acre virgin area containing broad-aged lodgepole pine and Engelmann spruce-alpine fir types. The pine is found on the lower ridges and dry slopes, while the spruce-fir is dominant along the stream bottom, on the moist slopes, and at the higher elevations. The drainage runs in a northwesterly direction. Elevations vary from 9,500 feet at the north to 11,500 feet at the south. Slopes are rather steep within the merchantable-timber area, but generally level off above it. The soil is predominantly granite-schist and well-drained except for the spruce bogs which occur occasionally. Average annual precipitation is about 24 inches, most of which falls as snow between October and May. The mean annual temperature is 35°F., with the July average 55°F., and the January average 15°F. (*4*). According to the Weather Bureau records (*8*), prevailing wind direction at the town of Fraser, 5 miles from the Experimental Forest, for 35 of the years from 1910 to 1947, was west during 19 years, north during 15 years, and northwest during 1 year.

Method

A 10-percent, ¼-acre sample-plot survey of the merchantable timber area within the watershed was made. The bearing from butt toward tip of all down timber 4.5 inches d.b.h. and larger on the plots was recorded by 20-degree sectors.

Because the way that a tree falls may depend on whether it is alive or dead, sound or rotten, the windfalls were placed in classes depend-

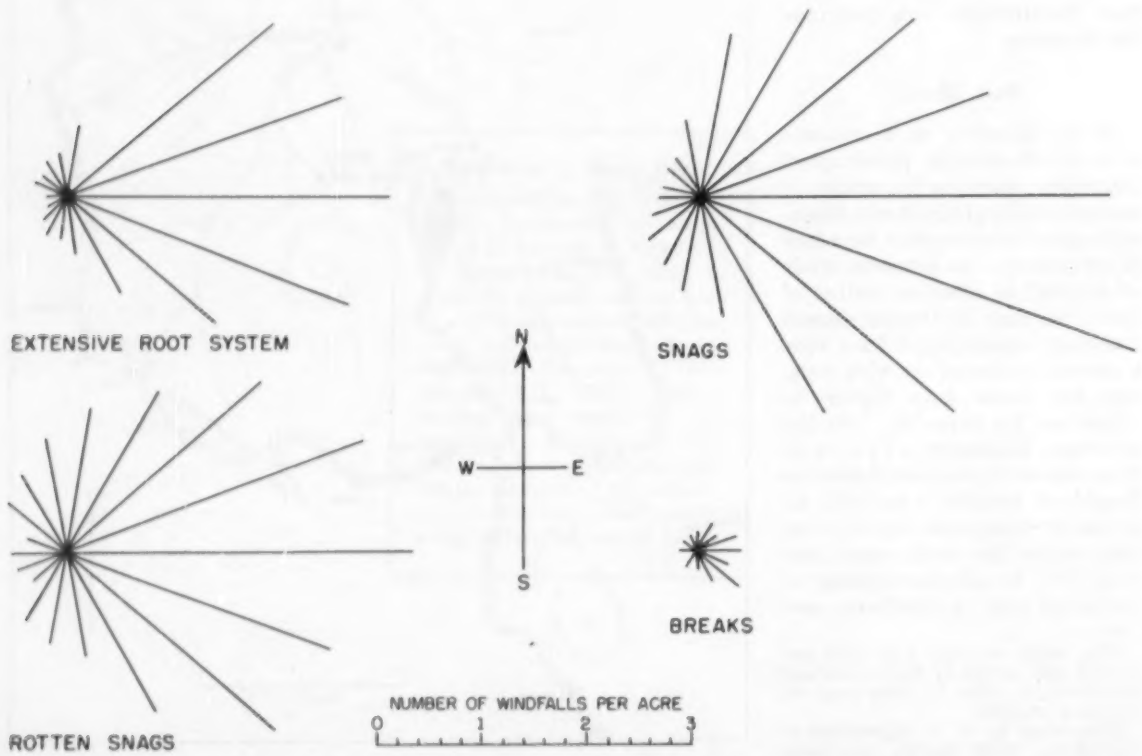


FIG. 2—Compass bearings, from butt to tip, of windfalls of different classes.

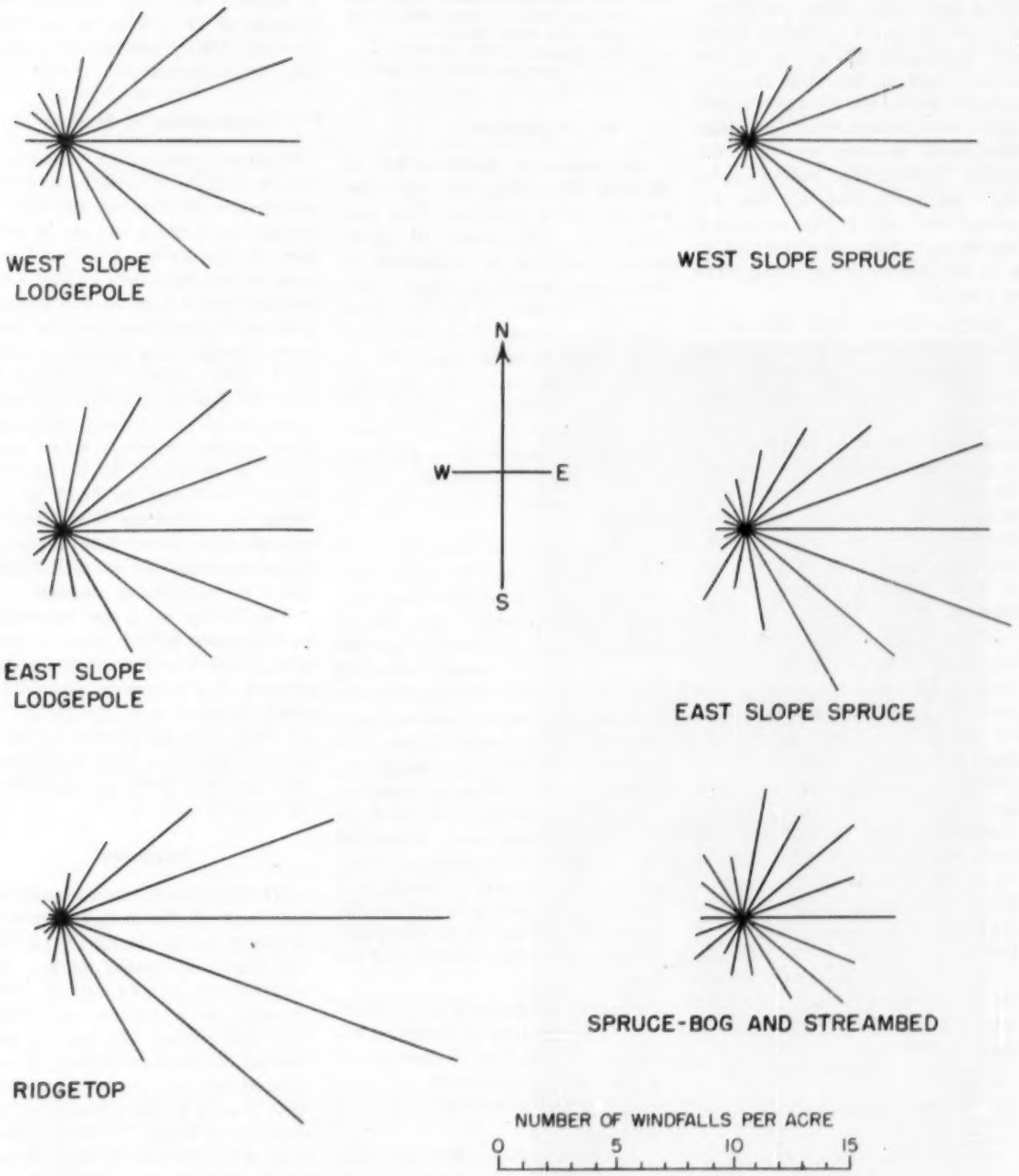


FIG. 3—Compass bearings of windfalls on plots of different forest types and aspects.

ing on their supposed reliability as indicators of destructive wind direction. The classification follows:

Extensive root system.—Observation has indicated that when a living tree blows down, an extensive root system is turned up along with a considerable amount of earth. Trees in this class are presumed to have been alive and sound before they blew down. Those that blew down so long ago that the trunks had almost rotted away could be recognized by the big mound of earth the roots had turned up. They were included so as to get records for as many years as possible.

Snags.—Down trees without a fibrous root system, but with spurs of the larger roots remaining were classed as snags which had fallen after death. This distinction was made because a snag offers less resistence to the wind. It may stand through many windstorms and then go over when the roots have decayed. For this reason snags may not be as reliable indicators of wind direction as the previous class of trees.

Rotten snags.—Trees which rotted off at or below the level of the ground, indicated by a swelling of the butt, presence of brown cubical rot and a lack of root spurs, were classed separately and considered still less reliable indicators of wind direction.

Breaks.—The fourth and last class was breaks—those trees which broke off because of rot or some other weakness in the trunk. This class was considered the least reliable indicator of wind direction.

To determine the effect of site on the windflow pattern, the plots were classified by aspect and forest type, as follows:

West slope—lodgepole pine.
West slope—spruce.
East slope—lodgepole pine.
East slope—spruce.
Ridge top.
Spruce-bog and streambed.

In order to detect the results of specific windstorms that were especially destructive or which came from an unusual direction, an effort was made to classify windfalls according to time since falling. The following descriptions are arranged in order of increasing time since blow-down:

1. Needles green.
2. Dead needles persisting.
3. Over 50 percent of the bole covered with bark.
4. Less than 50 percent of the bole covered with bark; generally sound except for small checks.
5. Bole in the process of decay.
6. Only the general outline of bole remaining.

Results

All classes of windfalls fell in easterly directions, the collective average being almost due east (Fig. 2). They were all about equally reliable as indicators of destructive wind direction. The average direction of fall for those down trees classified as having extensive root systems was N. 86° E. Snags fell on an average bearing of S. 85° E.; rotten snags, N. 86° E; and breaks, due E. The standard error of each of these averages is less than 2 degrees, and there are no significant differences among them.

The variation of windfall bearings was least on the ridge tops (Fig. 3). The lodgepole pine type was a more reliable indicator of destructive wind direction than the spruce type. Average windfall bearings did not differ significantly between the ridges, and east and west slopes, or between pine and spruce types. The only statistically significant differences occurred between the average direction on the spruce bogs and streambed plots compared to those on other sites. The trees had a tendency to fall more or less randomly on the moist areas. This can be attributed to the poor rooting condition of the trees.

Because of the lack of evidence of storms which failed to follow the general pattern of destructive winds, the classification of trees based on time since falling was not used.

The data indicate that the same general wind pattern exists throughout the Fool Creek watershed. Mapping windfall directions for the survey plots showed that some variation exists, but it is small and of little practical importance in the orientation of cutting strips. The prevailing winds are not modified by the high range of mountains 4 miles to the west of the watershed, nor by local topography within it. Destructive winds blow from a westerly direction, causing the trees to be thrown on an easterly bearing. Valley breezes have little effect on windfall.

Application of Method

Practical application elsewhere of this method of determining destructive wind direction should not require so large a sample as was used in this study. A tally of one class of windfalls only—those with extensive root systems—on sample plots well distributed over the proposed cutting area should be sufficient under ordinary conditions to give the general windflow pattern. Analysis of preliminary data will show whether more intensive sampling is necessary to obtain the desired accuracy. In order to increase the time-base of the study, special effort should be made to utilize as many old windfalls, indicated by mounds, as possible.

Classifying windfalls according to time since falling may be valuable where there is evidence on the ground of a change in destructive wind direction over the years. In all cases care should also be taken to make sure that trees which have been knocked down are not tallied as windfalls.

Summary

Windfall in cut-over stands has been one of the major causes of mortality in the forests of the Central Rocky Mountain Region. Alternate-strip clear-cutting offers promise as a harvesting method that will reduce this loss by protecting the residual stands, if cutting strips are properly oriented with regard to the direction of the destructive winds. While the direction of the prevailing winds is generally well known, little information is available on the direction of local destructive winds. To get this information for a 714-acre watershed on the Fraser Experimental Forest a sample-plot survey of the direction of fall of windfalls was

undertaken. A relatively uniform westerly windflow pattern for the entire watershed, uninfluenced by topography, was disclosed. The direction of fall was not affected by whether the trees were alive or dead before they blew down. The windfall pattern differed little with changes in aspect and forest type. The method described should be useful elsewhere in determining direction of destructive winds.

Literature Cited

1. BAKER, G. T. 1915. A windfall problem. Forestry Quart. 13: 317-324.
2. CURTIS, JAMES D. 1943. Some observations of wind damage. JOUR. FORESTRY 41: 877-882.
3. LEXEN, BERT. 1949. Alternate clear-strip cutting in the lodgepole pine type. Rocky Mountain Forest and Range Expt. Sta. Station Paper 1.
4. LOVE, L. D. and E. G. DUNFORD. 1952. The Fraser Experimental Forest, its work and aims. Rocky Mountain Forest and Range Expt. Sta. Station Paper 8.
5. ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION. 1947. Annual report. p. 32.
6. ————. 1949. Annual report. p. 45.
7. SMITH, KAN, and R. H. WEITKNECHT. 1915. Windfall damage in selection cuttings in Oregon. Proc. Soc. Amer. Foresters 10: 263-265.
8. U. S. WEATHER BUREAU. 1910-1947. Climatological data—Colorado Section. U. S. Dept. Agric. (1910-1939); Dept. Commerce (1940-1947).
9. WEIDMAN, ROBERT H. 1920. A study of windfall loss of western yellow pine in selection cuttings fifteen to thirty years old. JOUR. FORESTRY 18: 616-622.
10. ————. 1920. The windfall problem in the Klamath Region, Oregon. JOUR. FORESTRY 18: 837-843.

Elers Koch (1880-1954)

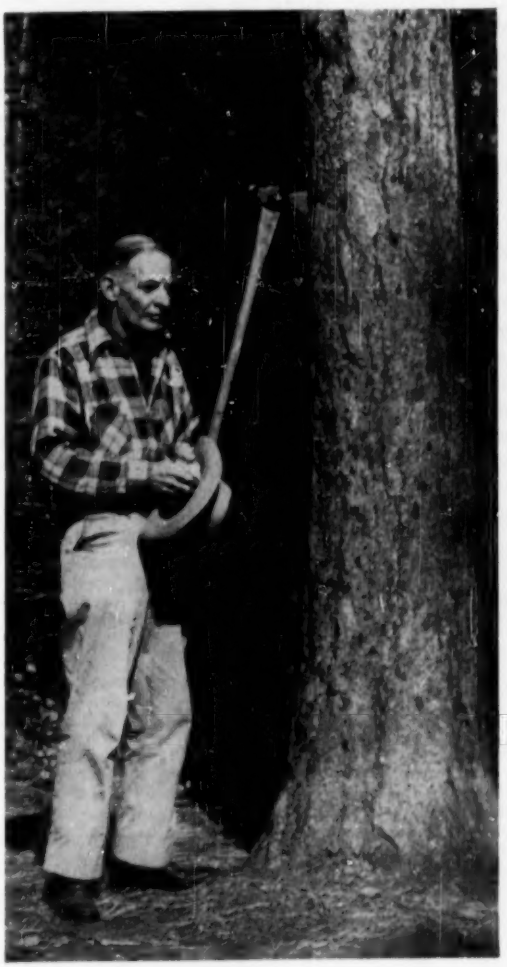
Elers Koch, 73, of Missoula, Mont. died apparently of a self-inflicted gun shot wound on November 21.

Born December 12, 1880 in Bozeman, Mont., Mr. Koch was graduated from Montana State College with a B.S. degree in 1901, and from Yale with the M.F. degree in 1903. In that year he entered the old Bureau of Forestry (now the Forest Service) as a field assistant.

His forestry experience, mostly in the West, was extensive. He was supervisor of the Lolo National Forest 1907-1918; and in 1920 became assistant regional forester in charge of timber management for the Northern Rocky Mountain Region at Missoula, the position he held with professional distinction until his retirement in 1942, after 39 years of continuous service.

Aside from forestry, Mr. Koch's chief interest was in Northwest history. He was an authority on the travels of Lewis and Clark. He was the author of numerous articles and several bulletins on forestry. His article "The Passing of the Lolo Trail" in the JOURNAL OF FORESTRY in 1935 attracted wide comment. In 1953 was published his novel *The High Trail*, a story of juvenile adventure.

Mr. Koch served on the Council of the Society of American Foresters during 1936-1937. He had been a member since 1905, and in 1939 was elected a Fellow.



Early Tapping for More Quality Sirup

Robert R. Morrow
Department of Conservation, New York State College of Agriculture, Cornell University, Ithaca

DURING recent years early sap flows have caught maple sirup producers unprepared in numerous instances. Good sap runs occurred in late February in three of the last four years in New York (denoted by asterisks in Table 1). Only in 1954 did an appreciable number of producers take advantage of this early flow. They did so profitably.

Early Sap Runs Are High Quality

February sap, and even some January sap, had a higher sugar content than April sap in the last four years (Table 1). March sap was often a little sweeter than February sap, but not every year. February sap was at least as sweet as the average sap from March and early April combined.

Sirup producers have traditionally made the best grades from the earliest runs, and 1954 was no exception. Willits[1] has suggested that this is partly due to changes in the sugar molecules as the season progresses. New York producers made a lot of fancy grade sirup in February 1954, although a very few made dark sirup for reasons unknown. Bacterial action can ordinarily be expected to be less early in the season than after warmer weather arrives.

A survey of sugar sand (a sediment which often requires extra time for removal) conditions on twenty-two farms scattered throughout New York showed that April sirup had an average of about twice as much sugar sand as February sirup in 1954, while March sirup had an intermediate amount of sugar sand. Whether this holds true every year is not known.

Early Sap Runs Difficult to Foretell

While early sap is usually high in quality, the quantity depends on the weather and is difficult to predict. In 1952 there was little sap before mid-March, but in eight central New York test localities (including 207 buckets) in 1953, from 20 to 26 percent of the season's sap flow occurred on February 24 to 27. It is significant that the sap flowed in about the same amount on these same days in lower Michigan after being predicted by the Weather Bureau.[2] This emphasizes that sap flow conditions may extend over large areas during part of the season, and often can be predicted. Unseasonably cold March weather made the remainder of the 1953 season extremely poor for many producers who missed this early run.

In 1954 the February sap flow accounted for about one-third of the season's flow, varying from 23 to 37 percent from February 18 to 28 at the same test localities. Many producers throughout the state caught these runs and had fine seasons, but again cold March weather hurt many who delayed tapping.

Early Tapped Trees Sometimes Stop First

In 1953 twenty-seven large open trees were selected and each was tapped on February 5, the trees being tapped alternately on the southeast and southwest sides. On February 26 the trees previously tapped on the southeast sides were tapped on the southwest side, and vice versa. Sap flow per bucket (quarts) was as follows:

	Feb. 5-26	Feb. 26-Mar. 15	Mar. 18-Apr. 3	Total
Early taps	26	15	26	67
Late taps	....	14	26	40

There was no evidence that late season sap flow decreased from early tap holes in 1953, but the experiment was repeated in 1954 with one change in technique. Fifteen of the trees were tapped on both the east and west sides on February 4, and the remaining 12 trees were tapped likewise on March 2.

[1] C. O. Willits of the Eastern Utilization Research Branch of Agricultural Research Service, U. S. Dept. Agric., Philadelphia.

[2] Robbins, P. W. Factors influencing the production of high quality maple sap. A progress report. (Summary.) Proc. Second Conf. on Maple Products. 1953.

TABLE 1.—SUGAR PERCENTAGES AND SAP FLOW OF SEVERAL MAPLE TREES

1951	Woods trees (2)	Open trees (6)	1952	Woods trees (4)	Open trees (18)	1953	Woods trees (14)	Open trees (20)	1954	Woods trees (14)	Open trees (22)
Date	*Sugar*	*percentage*	*Date*	*Sugar*	*percentage*	*Date*	*Sugar*	*percentage*	*Date*	*Sugar*	*percentage*
1/24	1.7	2.9	2/2-5	2.0	3.0*	.....	...	....	.....	...	....
2/12	1.8	3.1	2/11	...	3.0*	.....	...	....	2/15-16	2.0	2.9
2/16-22	1.7	3.6*	.....	...	.....	2/19-21	2.4	3.0*	2/18-21	1.9*	2.9*
2/25-26	1.8*	3.7**	.....	...	....	2/24-27	2.7**	3.0**	2/23-3/2	2.0**	2.9**
3/4-8	2.2*	3.8**	3/10-12	1.8	3.0*	.....	...	....	.....	...	....
3/12-21	2.0*	3.7**	.....	...	....	3/11-15	2.3**	2.9**	.....	...	....
3/23-24	1.9	3.5**	3/18-28	1.8**	3.5**	3/18-22	2.2**	2.8**	3/18-25	2.2**	2.9**
3/27-31	1.8*	3.1**	3/29-4/1	1.4*	2.9**	3/28-29	1.9*	2.6	3/27-28	2.0	2.7*
4/1-10	1.5	2.7**	4/3-7	1.4	2.7*				4/5-7	2.0**	2.5**

NOTE: Sugar percentage (soluble solids as sugar) measured by dipping a Carl Zeiss hand refractometer into stirred sap. Temperature corrections made. Trees located within 20 miles of Ithaca, New York. Figures in parentheses denote number of tap holes tested. Woods trees, 1 tap hole per tree; open trees, 2 tap holes per tree.

*Five or more quarts per bucket.

**Ten or more quarts per bucket.

Sap flow per bucket (quarts) was as follows:

	Feb. 4-Mar. 1	Mar. 2-28	Apr. 2-9	Total
Early taps	30	31	16	77
Late taps	....	31	20	51

The middle and late season production for the early and late tapped trees (47 and 51 quarts respectively) can be compared with the total 1953 production for the same trees (54 and 50 quarts respectively) when tapping dates were the same for all trees. Thus the 1954 production per bucket of the early tapped trees in middle and late season was reduced 8 quarts (about 15 percent). This 8 quart reduction came primarily from poor grade April sap compared to 30 quarts of good sap added by early tapping.

A group of 15 semiopen trees were tested in 1953 and 1954, with two buckets hung on each. Eight were tapped early in 1953, seven late; these were reversed in 1954 with the following results (quarts per bucket).

(1953 data)	Feb. 5-26	Feb. 26-Mar. 15	Mar. 18-Apr. 1	Total
Early taps	14	10	20	44
Late taps	....	13	20	33
(1954 data)	Feb. 4-Mar. 1	Mar. 2-28	Apr. 2-9	Total
Early taps	22	25	12	59
Late taps	....	31	16	47

The early tapped trees suffered an average yearly reduction of 7 quarts (about 17 percent) per bucket during middle and late season flows, compared to late tapped trees.

Twenty-two other trees, 12 roadside and 10 woods trees, were tested in the same way, except some had only one bucket. Average sap flow per bucket (quarts) was as follows:

(1953 data)	Feb. 5-26	Feb. 26-Mar. 15	Mar. 18-29	Total
Early taps	24	23	15	62
Late taps	....	24	16	40
(1954 data)	Feb. 4-Mar. 1	Mar. 2-28	Apr. 2-9	Total
Early taps	27	35	8	70
Late taps	....	45	22	67

The early tapped trees had an average yearly reduction of 13 quarts (about 24 percent) per bucket during middle and late season flows, compared to late tapped trees. Indeed for the entire year of 1954, these latter trees produced nearly as much sap as those tapped earlier, especially the woods trees.

All of these experiments tend to show that the late season flow in 1953 varied little between early and late tapped trees, while the late tapped trees outflowed the others in March and April 1954. The 1953 season ended quite abruptly, compared to the 1954 season, and may account for this. On the other hand, the 1954 season was one of the longest on record, and some trees flowed over two months. Many of the earliest tap holes and a few later ones dried up in late March and April, especially on the south side of the tree. The two years cannot be compared too closely, however, since there may be differences in sap production of the test trees, although the early tapped trees each year had approximately the same average diameter and crown sizes as the late tapped trees.

While early tap holes tend to flow less than late tap holes late in the season, sizeable early runs have more than made up for the loss with more and better quality sap in the last two years. In the future it may be possible to eliminate the effects of tap hole drying late in the season, either through reaming techniques or some method of combatting the bacteria in the tap hole.

Recommendations

1. Have equipment ready in case of early sap weather.

2. Tap at least one representative test tree in each sugar bush early in the season. Start of the sap flow varies with size of the tree and tree crown, openness, elevation, and exposure. Large-crowned trees in the open at low elevation often flow first.

3. A sap hydrometer (preferably large model that can be read to 0.1%) is useful for measuring sugar content of test trees. The sap should be stirred and free of ice; the hydrometer reading should be corrected for sap temperature.

4. Weather forecasts, especially five day temperature forecasts, are valuable in determining the arrival and length of sap flows.

5. Where tapping takes several days, tap the south sides of biggest trees first. If tapping has been delayed it may be more profitable to tap on the north sides of trees.

6. Sap should be collected daily if possible to avoid freezing damage to buckets.

❦❦❦

Golden Anniversary Dinner of U. S. Forest Service

The American Forestry Association and the Society of American Foresters will jointly sponsor a reception and dinner in the Statler Hotel, Washington. D. C. on February 4 in commemoration of the 50th anniversary of the U. S. Forest Service.

Several additional natural resource organizations are expected to join with the Association and the Society as cooperating patrons.

Any friend of forestry and of the Forest Service is welcome to attend. Tickets will be distributed by the two sponsoring organizations up to the capacity of the banquet room.

Adaptation and Use of a Form Class Slide Rule for Estimating Log Diameters in Standing Trees

E. R. Wilcox
Klamath Indian Agency,
Klamath Agency, Oregon

HIGH VALUES OF ponderosa pine stumpage have made it more desirable than ever to obtain an accurate estimate of the log-grade composition of a stand for which a stumpage value is to be determined. The accuracy of such an estimate will depend, to a great extent, upon the sampling methods used to obtain the basic data for the log-grade analysis and accuracy of judgment in estimating tree heights, diameters, and volumes of logs in the standing trees, and the grades of the respective logs.

To develop greater accuracy in judging the diameters of 16-foot logs in a standing tree, a 6-inch plastic-type slide rule has been modified for use in such work on the Klamath Indian Reservation, Ore. Estimation of log diameters was the immediate need but the rule has been further modified to show the volume, Scribner Decimal C, for each log diameter. Thus, the volume of any log of the tree can be estimated or, by adding the volumes of all the logs in a tree, the total tree volume may be obtained without reference to volume tables. Although this rule was adapted for a particular purpose, it might prove useful also to refer to log diameters and volumes occasionally in the field where one does not have ready access to tables. It is flat, and can be carried handily in a breast pocket, or even tucked inside the pages of a small field notebook.

A special pocket-size slide rule was devised by Gevorkiantz-Aamodt[1] in 1945. Their rule differs from the modified slide rule in that it regards the volume and growth of the tree as a whole, whereas the slide rule considers the diameters and volumes of the logs comprising the tree.

The data entered on the slide rule have been taken from a taper table published in the booklet entitled, *Board Foot Volume Tables for 16 Foot Logs,* by Mason, Bruce, and Girard. This table is reproduced, in part, with the permission of Donald Bruce. Information on half-log lengths contained in the original table has been omitted, since the slide rule includes data for full-log lengths only.

Table 1 expresses the d.i.b. at the top of each log of a tree as a decimal equivalent of the d.i.b. at the top of the first log of that tree. On this basis, the diameter of the first log of any tree is expressd as 1.00, and each successive log thereafter as a decreasingly sized decimal. If the form class of a particular stand is known, the diameter of the first log of a tree in that stand can be estimated by multiplying the d.b.h. of the tree by the form class, expressed as a percent. The diameters of the remaining logs in the tree can then be estimated by multiplying the diameter of the first log by the factors shown in the table for the respective logs.

The method for using the taper table is described primarily to illustrate that multiplication is the only mathematical process necessary for use of the table in estimating log diameters. The use of a slide rule to do this multiplication is just as simple as multiplication by any slide rule. On the 6-inch slide rule, as modified for this purpose, the process of multiplication is made simpler by placing on the slide a separate horizontal scale for each full-log tree height occurring in the Reservation stands. On each such scale, indicator marks are placed and numbered for the logs occurring in the tree. The positions of the indicator marks on the slide correspond, on a logarithmic scale, to the decimal equivalent of the respective logs found in the table. The indicator mark for the number one log, which is the same for trees of all heights, is represented by the vertical line at the right end of the horizontal scales. There are two sets of these horizontal scales on the slide shown in Figure 1. The set on the right half of the slide shows scales for trees from one to six log lengths in height; the set on the left for trees from seven to ten log lengths. The choice of the horizontal scale which is to be used for a particular tree is determined by the figure at the left end of each horizontal scale. This figure is the number of the top log of the tree.

For each set of horizontal scales there is a set of form class index lines on the slide. Each such set contains an index line for the form classes occurring in the various stands to be encountered. In estimating the diameters of logs in a tree, the index line corresponding to the form class is the point on the slide which is matched with

TABLE 1.—LOG DIAMETERS IN PERCENTAGE OF D.I.B. AT TOP OF 1ST LOG

Log-height in in terms of no. of 16-foot logs	Log position									
Log height	1	2	3	4	5	6	7	8	9	10
1	1.00									
2	1.00	.50								
3	1.00	.82	.50							
4	1.00	.89	.74	.50						
5	1.00	.92	.82	.69	.50					
6	1.00	.94	.87	.77	.66	.50				
7	1.00	.95	.89	.82	.74	.63	.50			
8	1.00	.96	.91	.85	.79	.71	.62	.50		
9	1.00	.96	.92	.88	.82	.76	.69	.60	.50	
10	1.00	.97	.93	.89	.85	.80	.74	.67	.59	.50

[1]Gevorkiantz, S. R. and E. E. Aamodt. Volume growth slide rule. JOUR. FORESTRY 43: 652-653. 1945.

the d.b.h. of the tree on the logarithmic scale "D" of the slide rule body. This latter scale retains its standard slide rule graduations (logarithmic scale from 1 to 10). Thus a d.b.h. of 24 inches would be read as 2.4 on the "D" scale. For illustration purpose, the two groupings of index lines drawn on the slide in Figure 1 include a line for each even-numbered form class from 74 to 86, inclusive.

The mechanical process is quite simple for using the slide rule in the determination of log diameters. Suppose it is desired to obtain diameters of the logs in a tree that has a d.b.h. of 38 inches, is five logs in height, and has a form class of 78. The determination of the diameters of the component logs is accomplished in three steps. (1) The slide is moved to a position in which the index line for form class 78 at the right end of the scale matches the d.b.h. of 38 (3.8) inches on the "D" scales; (2) keeping the slide in this position, the hairline is placed successively over the indicator marks numbered 2, 3, 4, and 5 on the horizontal scale for the five log tree (the horizontal scale with the figure 5 at the extreme left); and (3) the respective log diameters are read under the hairline on the "D" scale as 27, 24, 20, and 15 inches. The log number for the first log, which is at the same point on the slide for trees of all heights, is located at the top of the vertical line drawn at the right end of the horizontal scales. It is not necessary to move the hairline to this point on the scale in order to read the diameter of the first log, since the vertical line on the slide extends down to the "D" scale. In the example given above the diameter of this first log is 30 inches.

Figure 2 shows the rule set with the index line for form class 78 matching 38 inches d.b.h. on the "D" scale. The hairline has been placed over the mark on the slide indicating the second log of a five log tree. Under the hairline on the "D" scale one reads 27 inches, to the nearest inch. With the use of the taper table and long multiplication this value would have been determined as 27.27 inches.

It should be noted that the same horizontal scale is used for both two- and three-log trees. The diameter of the first log of each will, of course, be read at the same point. The diameter of the second log of the two-log tree will be read at the same point on the horizontal scale as the diameter of the third log of a three-log tree.

Having obtained the diameter of a 16-foot log from the rule, one may obtain the volume of that log by referring to a table showing volumes of logs by diameter classes. However, the same information can be placed on the body of the rule so that it is not necessary to refer to tables. This has been done on the examples shown in Figures 1 and 2. The volume, Scribner Decimal C, has been placed on the body of the slide rule. Thus, when the movable hairline is placed over a diameter on the "D" scale, the Decimal C volume of a 16-foot log of that diameter is read under the hairline on the opposite edge of the rule. In Figure 2, the volume of the log with diameter of 27 inches can be read as 55 (or 550 board feet when a zero is added).

The 6-inch slide rule which has been adapted for the foregoing purposes is manufactured by the C-Thru Ruler Company from relatively thin, white plastic type material. The original slide of this rule which contains the standard "B", "C1", and "C" scales is made of the same plastic type material as the body of the rule. Since this slide is approximately the same thickness as the white celluloid material used in "wet pads" for recording field notes in rainy weather, it allows for the substitution of a special taper table slide made from this latter material. The cost of special slides made by the manufacturer of the rule would be prohibitive for a small number.

This 6-inch slide rule is considered accurate enough for the purpose for which it was designed, and is also handy for field use. If greater accuracy is desired, similar information can be placed on larger rules. Such a rule has been constructed by Charles Worthman using paper scales glued to the slide of a standard 10-inch slide rule.

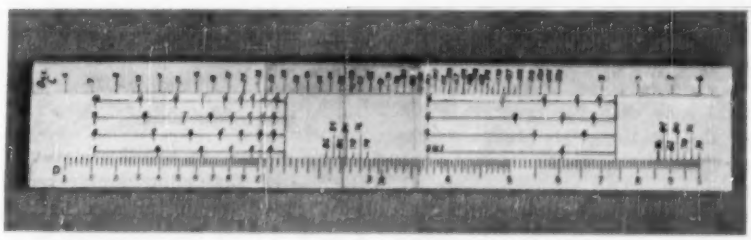


FIG. 1.—Form class slide rule showing two sets of horizontal scales.

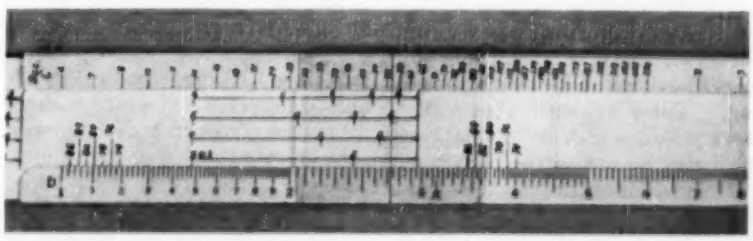


FIG. 2.—Slide rule set to show diameter and volume of second log of a 5-log tree whose d.b.h. is 38 inches and form class 78. (Log diameter 27 inches, volume 550 bd. ft.

Planting Stock Grades for Yellow-Poplar

G. A. Limstrom, R. F. Finn, and G. H. Deitschman
Foresters, Central States Forest Experiment Station
Columbus, Ohio[1]

THE IMPORTANCE of stock quality in establishing successful forest plantations is not sufficiently recognized. Too often availability rather than suitability governs the choice of trees used in forestation projects. That size and balance of planting stock for some species has a marked effect on field survival has been amply demonstrated by many investigators. Chapman (*1*) obtained significant differences in survival of shortleaf pine between various size classes and shoot-root ratios of seedlings of this species, and from the results of comprehensive tests has recommended minimum stock specifications for planting. In the Great Plains Region of the United States, Engstrom and Stoeckeler (*3*) found close correlation between field survival and stem diameters for many species. Rudolf (*5*) has set up minimum standards of stock quality for species commonly planted in the Lake States.

In England investigations and recommendations have followed a similar pattern. Edwards and Holmes (*2*) noted variation in survival among different size classes of Sitka spruce. They found "that while there is an increase in survival rate with the greater height of the seedling at planting, the survival is actually very much more dependent on general sturdiness of the plants as expressed by diameter, and by the proportion between height and diameter. The use of taller plants for planting has little effect on survival rates unless increased height is accompanied by a proportional increase in diameter." Some evidence shows that stock quality at time of planting may also have a marked effect on subsequent growth in the field. Pinchin (*4*) found highly significant differences in total height between "good plants" and "culls" of Sitka spruce, Norway spruce, and Douglas-fir, 8 years after planting.

Yellow-poplar (*Liriodendron tulipifera* L.), an important timber species, is planted extensively in sections of the Central States Region. Initial survival has been extremely variable. Although heavy losses are often the result of poor site selection for this species, poor survival often has been definitely traced to the use of low-quality planting stock. To obtain more data on the effects of planting-stock quality on subsequent field development of this species, two studies were begun in 1950 in the Region. The results of these studies, 2 years after field planting, have yielded information considered useful in current planting operations. The purpose of this paper is to report these results and to set up stock grading standards—now urgently needed—for yellow-poplar seedlings in the Central States Region. Height growth at this early stage in plantation development is not considered reliable enough to report at this time. Survival differences, on the other hand, have been significant enough to show how initial stocking, an important phase in any forestation program, can be improved.

Methods

One of the two studies involved the use of 1-0 yellow-poplar seedlings produced at five different nurseries from the same source of seed. The objective was to find out if any differences occurred in survival and growth for stock from different nurseries, and to correlate these differences with measurable differences in seedling characteristics. Trees from each nursery were planted on poor-to-medium-site old fields in southern Ohio, Indiana, and Illinois. Roots of all seedlings planted were pruned to a maximum length of 10 inches.

The second study involved a sample of 1-0 yellow-poplar planting stock produced at a single nursery for a private agency engaged in large-scale planting operations. The seedlings from this sample were sorted into five stem-diameter classes, 3/20, 4/20, 5/20, 6/20, and 7/20 inches measured at the ground line. The tops of half the total number of these seedlings in each diameter class were then pruned to a length of 5 inches. All classes of stock were then planted on the same sites used in the first study. In addition, equal amounts were planted on adjacent lands that had been strip-mined for coal.

In all field-planting tests, detailed records and measurements were made for each seedling just before planting. These included measurements of root and shoot lengths, stem diameters at ground line and 1 inch above ground line, and notes on root development and general appearance. This information makes it possible to compare future development of each tree with characteristics recorded at the time of planting. A small sample of each stock class was also taken for detailed laboratory measurements to determine average air-dry and oven-dry weights, and shoot-root ratios.

Results

In the first study, designed to compare seedling production and development in five different nurseries from the same source of seed, many differences were observed (Fig. 1 and Table 1). The number of seedlings produced from the same quantity of seed varied from 75 to 655. There were striking differences in average size and balance. Individual 25-tree lots varied in average stem diameter from 2/20 to 8/20 inches at the ground line, in root lengths from 5 to 15 inches, and in top lengths from 3 to 8 inches. Shoot-root ratios based on lengths of tops to roots varied from 0.35 at Nursery "E" to 0.73 at Nursery "B." Seedlings produced at Nursery "A" had well-developed root systems, fairly large stem diameters, but rather short tops. Those produced at "B" had rather

[1]Forest Service, U. S. Dept. Agric.

short roots, poor laterial root development, but a better balance between tops and roots than those grown at "A." Seedlings produced at "C" had long well developed root systems, correspondingly long tops, and large stem diameters. Stock produced at "D" was small and spindly, with poorly developed roots, short tops, and small stem diameters. At Nursery "E" the stock produced had good root systems with strong lateral root development, but with short, stubby tops.

Average field survival at the end of the second growing season varied from 68 percent for Nursery "D" to 89 percent for Nursery "C." The differences among some nurseries, as determined by Chi-square analyses, were highly significant. By analysis of covariance it was found that survival for the seedlings produced at the five nurseries was correlated chiefly to stem diameter, and that this accounted for the main differences in survival among seedlings from the different nurseries. There were no significant differences, moreover, among regressions of survival over stem diameter for the individual nurseries. A common regression (Fig. 2) was therefore computed, based on the survival by diameter classes for each nursery and site. Estimated survival, from this regression, rises rapidly from 37 percent for seedlings in the 3/20ths-inch diameter class to 89 percent for the 6/20ths-inch class, and then declines to 76 percent for the 8/20ths-inch class.

Although the foregoing analyses show that the survival differences are due chiefly to stem-diameter differences, they do not explain why differences in size and weight are so pronounced among nurseries. Soil fertility for all nurseries appears adequate. Differences in seed treatment, germination, seedbed density, watering, and nursery culture are all no doubt contributing factors, and it would be difficult to evaluate the effect of each factor separately. The wide variations in seedbed density and physical properties of the seedbed soils were perhaps the most important.

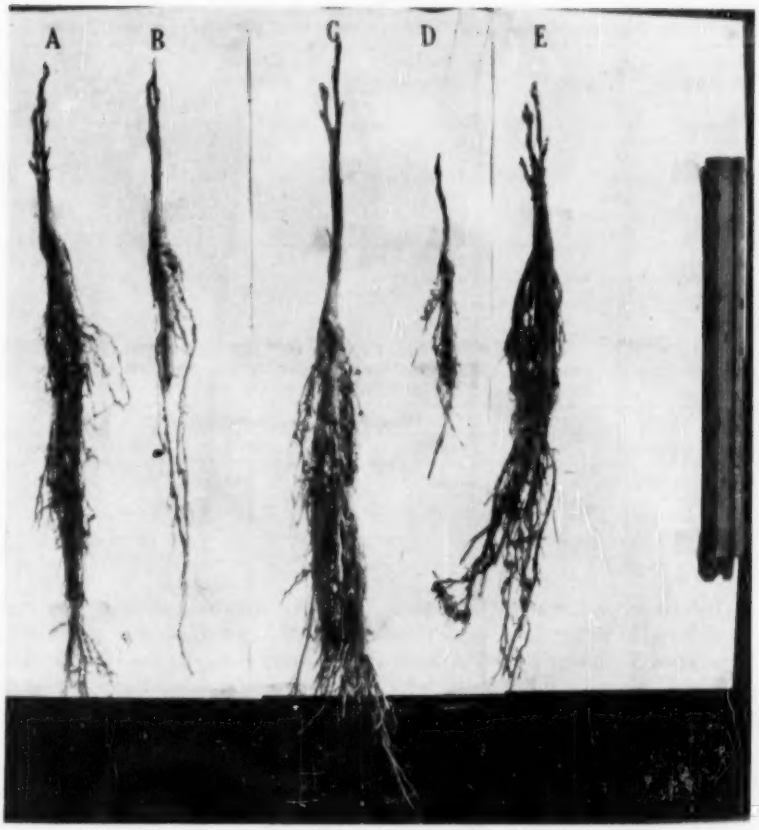


FIG. 1.—Typical 1-0 yellow-poplar seedlings produced at five different nurseries from the same seed source. (Photo taken before roots were pruned.)

TABLE 1.—COMPARISON OF 1-0 YELLOW-POPLAR SEEDLINGS PRODUCED AT FIVE DIFFERENT NURSERIES FROM EQUAL AMOUNTS OF SEED FROM THE SAME SOURCE

Variable	Nursery A	B	C	D	E
Seed:					
Treatment	Stratified	None	None	Stratified	None
Season sown	Spring	Fall	Fall	Spring	Fall
Seedling production:					
Number produced	655	575	234	350	74
Density, No. per sq. ft.	7	5	2	9	4
Seedbed soil analyses:					
Plasticity	Very slight	Moderate	Very slight	Slightly plastic	Highly plastic
Percent sand	87.5	26.0	78.5	15.5	33.5
Acidity, pH	5.6	7.6	5.4	5.9	6.0
Seedling foliar analyses:					
Nitrogen, percent	3.00	3.04	2.74	2.21	2.10
Phosphorous, percent	.446	.403	.320	.296	.220
Potassium, percent	1.63	2.58	1.16	1.96	1.40
Calcium, percent	0.54	0.73	0.95	0.57	0.64
Seedling characteristics:					
Stem dia. 1/20th in.	5.1	4.7	7.2	3.9	6.3
Length tops, inches	5.2	4.6	7.9	3.2	4.0
Length roots, inches	12.4	6.3	13.8	5.9	11.3
Shoot-root ratios:					
Oven-dry weight	0.43	0.60	0.38	0.43	—
Length tops & roots	0.42	0.73	0.57	0.54	0.35
Field survival, 2nd year, percent	73	72	89	68	75

TABLE 2.—SECOND-YEAR FIELD SURVIVAL PERCENT OF 1-0 YELLOW-POPLAR SEEDLINGS BY STEM-DIAMETER CLASS (ROOTS OF ALL SEEDLINGS PRUNED TO 8 TO 9 INCHES)

Diameter at ground line (inches)	Ohio plantings		Indiana plantings		Illinois plantings		Average	
	Old fields	Mine banks	Old fields	Mine banks	Old fields	Mine banks	Old fields	Mine banks
3/20	78	68	59	60	6	24	47	51
4/20	98	80	74	64	60	26	77	57
5/20	94	92	96	82	52	24	81	66
6/20	100	88	98	78	82	54	93	73
7/20	96	84	100	74	50	26	82	61
Average	93	82	85	72	50	31	76	61

TABLE 3.—SECOND-YEAR FIELD SURVIVAL PERCENT OF 1-0 YELLOW-POPLAR SEEDLINGS BY TOP-PRUNING AND STEM-DIAMETER CLASS (ROOTS OF ALL SEEDLINGS PRUNED TO 8 TO 9 INCHES)

Treatment	Stem-diameter class (inches)					
	3/20	4/20	5/20	6/20	7/20	Average
Tops pruned to 5 inches	49	67	71	84	70	68
Tops not pruned	49	67	75	83	73	69

In the second study (field tests to determine differences in survival and growth among different stem-diameter classes) the results were highly significant (Table 2). Differences in site and climatic conditions are also reflected by the contrasts in survival between old fields and mine banks and among the planting areas in the three states. In Illinois, particularly during the second growing season, extreme drought conditions prevailed; moisture conditions were only slightly better in Indiana; while in Ohio only moderately dry weather occurred over the same period. There was a marked increase in survival from the 3/20ths-inch to the 6/20ths-inch diameter class and then a decline in the 7/20ths-inch class. This trend was accentuated in Illinois where extreme drought conditions prevailed. Of particular interest is the fact that there were no significant survival differences between unpruned stock and stock that had been top-pruned to 5 inches (Table 3).

The regression calculated for the stock used in the second study also discloses a distinct relation of stem diameters to survival (Fig. 3). In these tests, which were conducted on old fields and mine banks, the survival begins to drop after reaching a high of 76 percent for the 6/20ths-inch class. The roots of seedlings used in this study had been pruned to a maximum length of 8 to 9 inches to facilitate planting. By pruning to these lengths the actual "bulk" of root systems of seedlings in each diameter class became strikingly similar (Fig. 4).

Growth trends during the first 2 years, as influenced by diameter and top-pruning, were similar to those recorded for survival. Beween sites, growth has been significantly better on the mine banks than on the old fields. The plantings are considered too young, however, to yield conclusive evidence on growth.

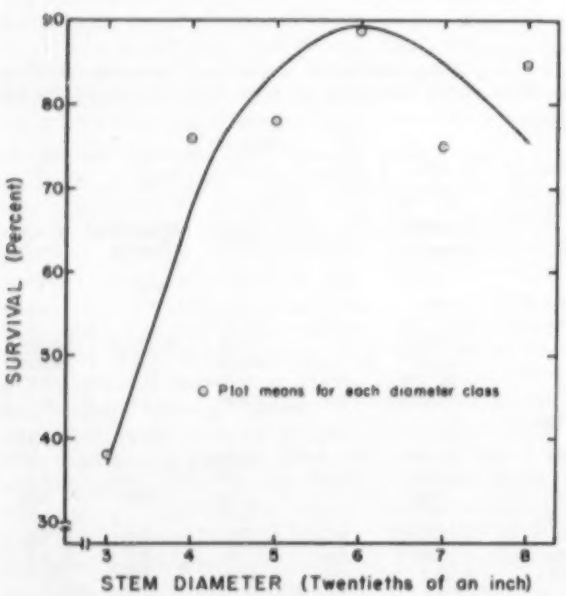


FIG. 2.—Relation of stem diameter at ground level to second-year survival of 1-0 yellow-poplar seedlings planted on old fields in Ohio, Indiana, and Illinois. Roots pruned to maximum length of 10 inches.

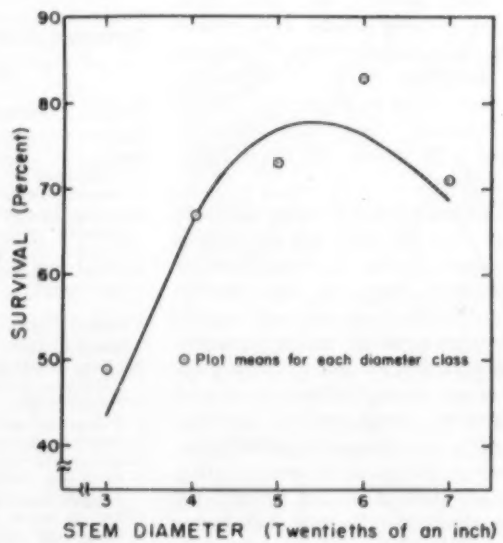


FIG. 3.—Relation of stem diameter at ground line to second-year survival of 1-0 yellow-poplar seedlings planted on old fields and mine banks in Ohio, Indiana, and Illinois. Roots pruned to maximum lengths of 8 to 9 inches.

A large number of statistical analyses were made to find out the most important factors influencing survival. What accounts for the difference in survival among nurseries for seedlings produced from the same source of seed? If survival improves with each successive increase in stem diameters up to a certain size, why is survival of larger diameter seedlings lower under ordinary methods of field planting? For this species, shoot-root ratios based on weights of tops and roots apparently have little significance.

The ratios given in Table 1 for the first study, for example, bear no clear-cut relation to field survival, and in the second study these ratios varied only from 0.696 for the 3/20ths-inch diameter class to 0.663 for the 7/20ths-inch diameter class. Regression analyses made to evaluate the effect of shoot-root ratios based simply on lengths of tops and roots also disclosed little significance. Only in such extreme cases, as where tops were less than one-third the length of roots, did real differences in survival occur. Seedlings in the latter class are obvious culls.

Although roots of seedlings used in the first study were pruned to a maximum length of 10 inches, there were of course a large number of seedlings that required no pruning. The mean survival of those seedlings that had been root-pruned was 83 percent, while the survival for those that had not been root-pruned was only 69 percent. Except for seedlings larger than 6/20ths-inch in diameter, root-pruning to 10-inch lengths had little or no injurious effect on survival for stock in the range of diameters tested. The generally lower survival of seedlings with the shorter roots, even when not pruned, is of special interest. These results, though empirical, indicate that root-pruning to extremely short lengths may be harmful not from the actual pruning operation but mainly from excessive reductions in the quantity of roots.

Analysis of the data also indicates that the length of tops, alone or in relation to root length, had no significant bearing on field survival. The fact that survival for top-pruned seedlings was as good as for those not pruned supports this conclusion. A better measure of stock balance appears to be the relation of stem diameter to the actual lengths of roots when seedlings are planted.

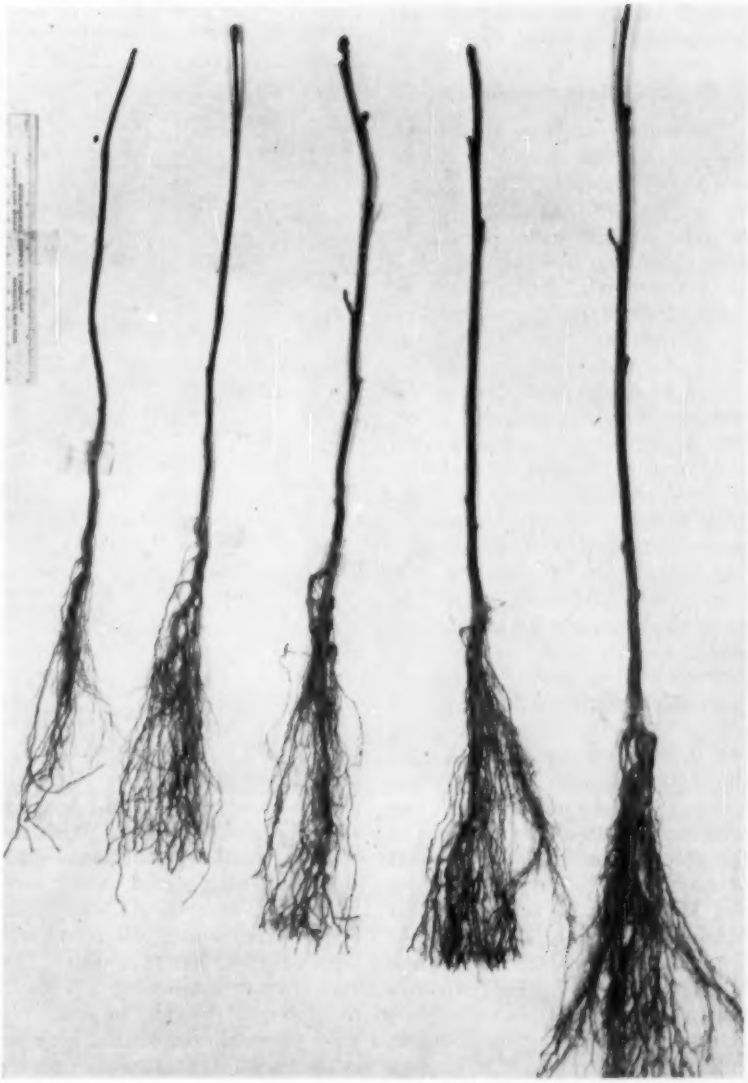


FIG. 4.—Typical seedlings of 1-0 yellow-poplar planted in series of tests to determine relation of diameter class to survival. From left to right are seedlings of the following stem-diameter classes: 3/20, 4/20, 5/20, 6/20, and 7/20. Roots of all seedlings pruned to maximum length of 8 to 9 inches.

The degree of root pruning to facilitate the actual planting operation may, therefore, have an important effect on survival. It is no doubt the chief reason for the decline in survival of seedlings above certain stem diameters for the more heavily root-pruned stock. This behavior is perhaps due to a disturbance of the balance among physiological processes brought about by root-pruning. Most of the food is stored in the thickened portion of the roots while root-elongation and water absorption are functions mainly of small roots and the tips of larger roots. Excessive root-cutting of seedlings with large stem diameters does not retard the growth of the aerial parts during the first two growing seasons, but if a drought occurs the roots are not sufficiently devel-

oped to supply the amount of water needed for survival.

Grading Recommendations

For widespread use, stock-grading specifications should be simple and easily applied. They should be so standardized that simple sampling procedures will determine if grading is actually needed. The nurseryman needs to know the proportions of each grade in any lot of planting stock he has produced. Purchasers, or men in charge of actual field-planting operations, should know the standards required for major site-types and for each method of planting. If roots must be pruned to maximum lengths of 8 to 10 inches to permit planting with a bar or a particular type of planting machine, the standards must be more rigid than for other planting methods which do not require root-pruning to these short lengths.

As an example of nursery sampling, the results of the first study are summarized in Table 4. In this case roots were pruned to a maximum length of 10 inches. For seedlings 4/20th-inches or larger at the ground line, the field survival of stock produced at all nurseries was 75 percent or better. But at Nursery "D" only 36 percent of the seedlings produced were this large, while at all other nurseries this percentage was 85 or higher. Except for throwing out obvious culls, no grading would have been necessary in Nurseries "A," "B," "C," and "E," to meet these diameter specifications. Determinations of this kind can be made by simple sampling procedures at the nursery. For seedlings 5/20th-inches or larger the survival in all cases has not been materially increased over the 4/20th-inch standard; but the proportion of seedlings in this class fell below 65 percent for all but two nurseries.

As has been shown, weather conditions have an important bearing on initial field survival. With favorable weather conditions—difficult to predict—good initial survival may be obtained with stock of low average stem diameters and diameter-root length ratios. The standards recommended in Table 5 are intended to help in obtaining good survival even during growing seasons with moderately severe droughts. Site conditions, especially those having a bearing on moisture and aeration, are especially important in setting up stock-grading standards. On dry, exposed sites, such as large old fields with no protective cover and the upper slopes of barren mine banks, mortality may be much more severe than on more moist, protected sites. Separate specifications are therefore recommended for each of these broad site classes.

TABLE 4.—COMPARATIVE SURVIVAL AND PRODUCTION OF 1-0 YELLOW-POPLAR SEEDLINGS BY NURSERIES AND VARIOUS GRADING STANDARDS (ROOTS PRUNED TO MAXIMUM LENGTH OF 10 INCHES)

Nursery	Stem-diameter class (inches)					
	Less than 4/20		4/20 and larger		5/20 and larger	
	Total production	Survival	Total production	Survival	Total production	Survival
	Percent					
A	13	33	87	78	61	79
B	15	66	85	75	45	77
C	0	—	100	89	99	89
D	64	52	36	77	21	87
E	1	0	99	77	87	78

TABLE 5.—PLANTING STOCK GRADES FOR YELLOW-POPLAR IN THE CENTRAL STATES[1]

Site	Stem diameter (inches)			
	Minimum		Maximum (if roots are pruned to 10 inches or less)	
	At ground line	1 inch above ground line	At ground line	1 inch above ground line
Dry, exposed	5/20 or 1/4	4/20 or 1/5	7/20 or 11/32	6/20 or 10/32
Moist, protected	4/20 or 1/5	3/20 or 5/32	8/20 or 13/32	7/20 or 11/32

[1]Discard all seedlings with broken tap-roots, scarred roots, and all seedlings with tops shorter than ⅓ length of roots before pruning.

If 80 percent of the seedlings in a representative sample meet the desired standards, grading is neither necessary nor practicable. To reduce packing, shipping, and planting costs, the tops of seedlings may be pruned to a minimum length of 5 inches.

Literature Cited

1. CHAPMAN, A. G. 1948. Survival and growth of various grades of shortleaf pine planting stock. Iowa State Jour. Sci., 22 (4):323-331.
2. EDWARDS, M. V., and G. D. HOLMES. 1951. Experimental work in the nursery. Forestry Commission Report on Forest Research for the Year Ending March, 1950. pp. 12-24.
3. ENGSTROM, H. E., and J. H. STOECKELER. 1941. Nursery practice for trees and shrubs suitable for planting on the prairie-plains. U. S. Dept. Agric. Misc. Pub. 434. 159 pp., illus.
4. PINCHIN, R. D. 1951. Nursery extension experiments at Rodnor Forest. Forestry Commission Report on Forest Research for the Year Ending March, 1950. pp. 24-27.
5. RUDOLF, PAUL O. 1950. Forest plantations in the Lake States. U. S. Dept. Agric. Tech. Bul. 1010. 171 pp., illus.

Notes

A Grafting Technique for Forest Genetics Research

The special grafting procedure used for forest genetics research at the University of Florida can speed the progress of forest tree improvement. The method has been tested at all seasons of the year for slash and loblolly pine. Multiplication of desirable woody plant forms by grafting is too ancient and widespread a practice for anyone to safely claim to have developed a "new method." The technique here described is a fortunate combination of many long established procedures and particularly serves the need of the forest geneticist who works with the southern pine species.

The Technique

A normal cleft graft is made with woody or (succulent) scionwood, depending on the season. The stock is decapitated and split down the middle and the scion, cut into a wedge, is inserted in the split stock. The diameter of the stock and scion should match as nearly as possible. The graft is tied with grafting rubber and covered with a polyethylene bag.[1] The polyethylene bag is tied tightly at the bottom and holds in the moisture of transpiration, thus serving as an individual sweat-box for each plant. By careful manipulation and a tight tie in the polyethylene bag will be held in an inflated form over the graft.

Where no lathhouse is available to provide shade, a kraft paper bag may be placed over the polyethylene bag to prevent sun scald. When working with slash and loblolly pine, the polyethylene bag should not be removed for six weeks.

Advantages

Normal grafting methods yield good percentages of successful grafts only during the spring months. Grafts can be made successfully with the described method at any time of the year. The percentage of successful grafts is highest in the spring but, even without a lathhouse, fair percentages are obtained under the hot sun of July and August. Only in the months of May, June, and early July are the percentages of successful grafts too low for practical work. With this grafting method the geneticist can concentrate on pollination work during the late winter and spring instead of dividing his time between pollination and grafting.

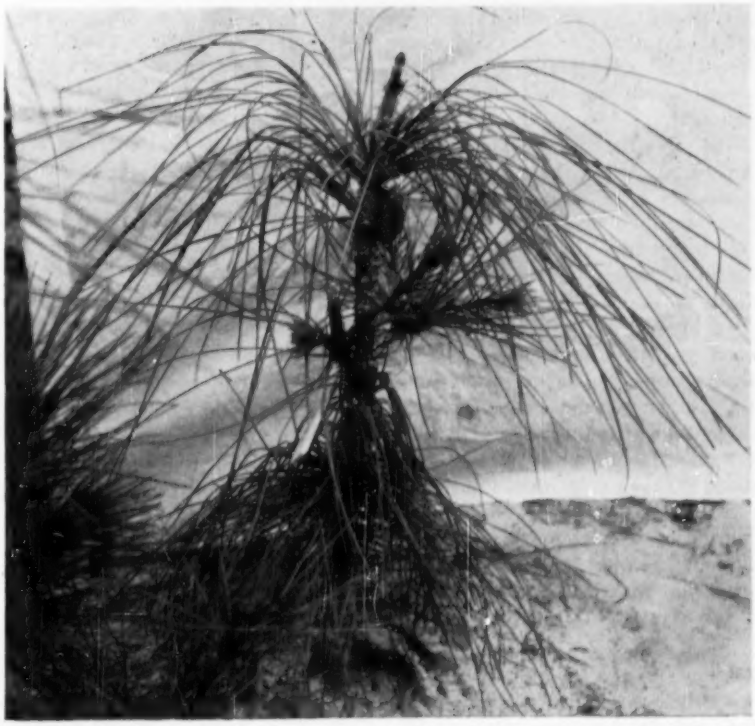


FIG. 1.—Six-month-old graft bearing two sets of cones. This graft will produce seed in 1954 and 1955.

Cone bearing twigs of slash pine grafted in August retained their cones and flowered again in January. Eight month old grafts in our nursery have two sets of cones on them. One set will mature seed in 1954 and one set will mature seed in 1955 (Figure 1).

Slash and loblolly pine twigs showing male and female flower buds can be grafted as late as one month before flowering and the flowers will mature. Consequently special trips to collect pollen can be avoided and all pollen can be collected in the greenhouse at it matures.

Previous experience in this country and in Europe indicates that cone bearing grafts will continue to flower uninterruptedly. By using such a grafting technique forest geneticists will not have to climb trees to make controlled pollinations. Many pollinations can be made in a given season where only a few could be made before with traditional tree climbing methods. Southern tree improvement workers often lose 75-100 percent of their pollinated cones through damage by insects and disease. These losses could be eliminated through spraying and other measures in seed orchards established with cone bearing grafts.

THOMAS O. PERRY
University of Florida, Gainesville

[1] Albert G. Johnson of the Arnold Arboretum developed the use of polyethylene bags for grafting pines.

New Diameter Increment Rule

Various methods of determining and predicting growth rates require that the present d.b.h. and the d.b.h. ten years ago, both measurements outside bark, be determined.

The present d.b.h. outside bark can, of course, be measured quite accurately with a tape or calipers. To determine the d.b.h. outside bark ten years ago requires that an increment boring be taken. The width of the last ten rings multiplied by two is the last ten years' wood growth in diameter. For a given species, the bark growth during the same period is a certain percentage of the wood growth and it varies from one species to another. The numerical values of these percentages are best derived from the available ratio K of diameter outside bark D to diameter inside bark d. This ratio:

$$K = \frac{D}{d}$$

is known as the bark factor and it is easily seen that for a given K the bark thickness is obtained by the formula:

$$\text{Bark thickness} = \frac{1}{2}(D\text{-}d) \qquad = \frac{d}{2}(K\text{-}1)$$

The bark factor is multiplied by the ten-year diameter growth of wood to arrive at the total ten-year diameter growth of the wood and bark. This ten-year growth is then deducted from the present d.b.h. outside bark to arrive at the d.b.h. outside bark ten years ago.

To eliminate the multiplications necessary under the above procedure and thus save time and reduce the number of errors, the writer designed a diameter increment rule. By measuring the width of the last ten annual rings on the appropriate bark factor scale the total ten-year diameter growth of wood and bark is read direct.

This is possible since, $I = 2r \cdot K$ where I is the ten-year diameter growth of wood and bark, r is the width of the last ten annual rings, and K is the bark factor.

It was found through experience that scales able to measure four inches of diameter growth were adequate. To find the length of the scale for any one bark factor, the following formula was used: Diameter growth of 4 inches

$$= \frac{4}{2K} \cdot 1$$

Each answer from the above formula is then divided by 40 to determine the scale graduations for each bark factor. For the species growing in Pennsylvania, scales for bark factors from 1.04 to 1.15 are adequate.

A supply of these rules was made by a commercial rule company for the Pennsylvania Department of Forests and Waters during the summer of 1953. During 1954, after the rules were used extensively on a major inventory and growth study project, they were found to be entirely satisfactory.

Paul Drury, assistant to District Forester E. C. Pyle at Stroudsburg, initiated the practice of using India ink to write the abbreviations of the species concerned under the appropriate bark factor scales. The India ink is then covered with clear finger nail polish. The polish and the ink can easily be removed when different species are being measured.

Bibliography

MEYER, H. ARTHUR. 1948. Forest mensuration. Penn Valley Publishers, Inc., 357 pp.

J. E. IBBERSON
Chief, Division of Research, Pennsylvania Department of Forests and Waters, Harrisburg

Grid System for Randomized Block Layout

A simple and efficient scheme for experiments having the common randomized block design has been used to advantage on the Chipola Experimental Forest in the sandhills of west Florida. By making advance provision for concentrating studies, it avoids chopping up an entire experimental forest for numerous, scattered, small-plot tests.

On the Chipola, many small exploratory studies were required to compare the effect of various treatments on the survival and growth of planted pine seedlings. To obtain adequate sampling of the area, four separate locations were chosen. At each location, a square block was surveyed and divided into a grid of 100 equal plots. The plots

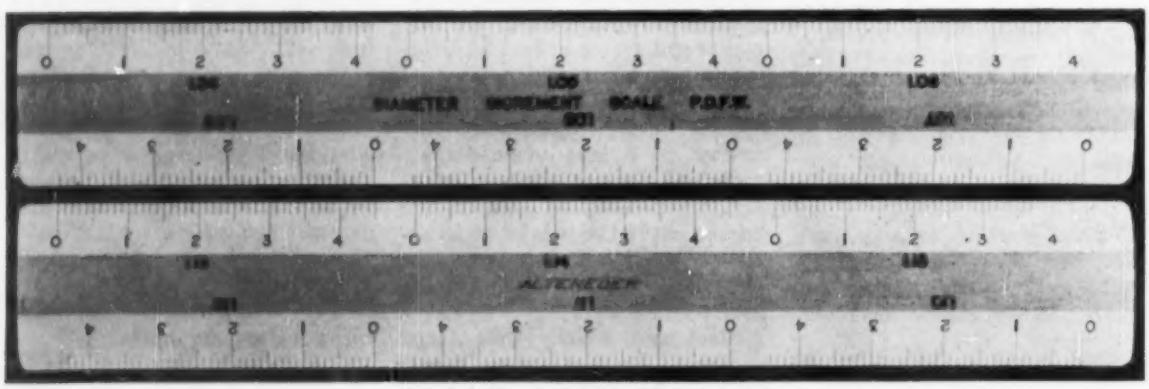


FIG. 1.—Diameter increment rules.

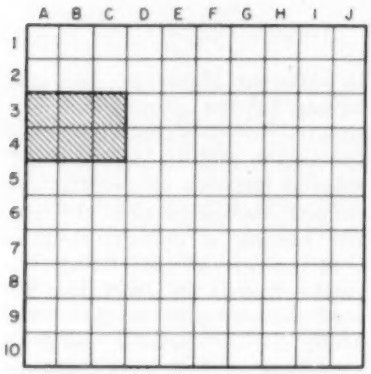


FIG. 1.—Grid layout. Shaded area represents plots assigned to a hypothetical study.

were numbered as shown in Figure 1. Individual studies were assigned to the same group of plots in all grids. Then study treatments were randomized within each group.

For example, a study having six treatments might be assigned plots A3, B3, C3, A4, B4, and C4 in each grid. Randomization of the four replications might then be:

Treatments

	Grid 1	Grid II	Grid III	Grid IV
		Plots		
1	B4	C4	A3	B3
2	B3	B3	B4	C3
3	C3	C3	A4	A4
4	A4	B4	C4	B4
5	C4	A3	C3	A3
6	A3	A4	B3	C4

In addition to using the experimental area efficiently, the grid system simplifies the establishment and monumentation of plots. Site preparations common to several studies can readily be applied. Where recurrent measurements are needed, the similarity of plot locations speeds up the work, reduces the probability of location errors, and generally aids the progress of tallymen from plot to plot and study to study.

D. L. FASSNACHT
East Gulfcoast Research Center, Southern Forest Experiment Station, Forest Service, U. S. Dept. Agric.

FIG. 1.—Ponderosa pine shoots cut and peeled by red squirrels. On the two unpeeled shoots, next year's conelets and a flower-bearing vegetative bud are shown.

Pine Squirrels Reduce Future Crops of Ponderosa Pine Cones

It is generally known that the red squirrel (*Tamiasciurus hudsonicus*) harvests great quantities of the cones of ponderosa pine (*Pinus ponderosa* Laws.). In the process of cutting these cones the squirrels often cut not only the cones themselves but may also remove entire ends of the shoots which bear the cones. Squillace[1] points out that "when these shoots also bear one-year-old conelets, the [cone] crop for the following season is reduced accordingly." He reports a 9-percent loss of conelets from this cause, and he states further, "cutting the cone-bearing shoots no doubt reduces the flowering potential for at least the next few seasons."

Squirrels also reduce future cone crops by another kind of food gathering. In winter, in northwestern Montana, they often cut the shoots from the ends of the branches in order to get at the cambium layer (Fig. 1). After many shoots are dropped, the squirrel descends to the ground and eats the cambium from them. The needles, conelets, and woody stems are not eaten. Usually only a few of the many cut shoots are actually utilized by the squirrels.

On Bull Island in Flathead Lake, Montana, I have at times found more than a hundred of these shoots lying under one pine tree. Some of these shoots bear immature conelets near their tips. The following summer's flower anlagen are born closely associated with the vegetative buds.

This feeding on the cambium has been observed only in the winter season. Possibly it occurs mostly during those winters when the stored cones are in short supply and the squirrels are forced to seek secondary sources of food. If so, then it is apparent that a year in which few cones are produced may result in intensified damage extending into the years immediately following.

LOWELL ADAMS
Wildlife Research Biologist, Fish and Wildlife Service[2]

[1] Squillace, A. E. Effects of squirrels on the supply of ponderosa pine seed. Northern Rocky Mountain Forest and Range Exp. Sta. Research Note No. 131. 1953.

[2] Fish & Wildlife Service in cooperation with the Intermountain Forest and Range Experiment Station, Ogden, Utah.

Points of View

Comments on "Growing Stock in the All-Aged Forest"

In a recent paper of the above title R. R. Reynolds discusses some problems of determining the desirable or normal stocking for the managed all-aged forest.[1] He emphasizes the point that a balanced or normal all-aged forest cannot be considered as the equivalent of an intricate mixture of small even-aged stands showing an even distribution of age classes. On the basis of a comparison between the diameter distribution of a normal even-aged forest and that of a balanced all-aged forest following the law of de Liocourt, he concludes that "full stocking for maximum board-foot growth in all-aged stands may be only one half and at most two-thirds of the even-aged concept of full stocking."

This conclusion appears to be based on the data for loblolly pine presented as Tables 1 and 2 showing the number of trees by 2-inch diameter classes for a normal even-aged and a balanced all-aged forest respectively. As indicated above, the diameter distribution for the all-aged forest is based on the law of de Liocourt. Reynolds assumes one tree per acre in the 26-inch diameter class and a quotient for the number of trees in two successive diameter classes equal to 1.40. He subsequently states that de Liocourt's law has its weakness since the structure it implies is too dependent upon a pure guess as to the largest size tree that would be grown and on the number of trees of this size that would occur per acre. The purpose of this note is to indicate that there is no need to make such a guess, which might be misleading indeed. To illustrate, using the same quotient 1.40, but assuming the largest tree to be in the 24-inch diameter class, the volume per acre would be reduced to 1,369 cubic feet as compared to 2,037 cubic feet given in Table 2. On the other hand, with the largest tree in the 28-inch diameter class, the resulting volume per acre would be equal to 2,987 cubic feet. This clearly shows that it is not safe to crudely estimate the diameter class showing just one tree per acre.

The study of the possible balanced structures of all-aged forests must be based on actually obtained diameter distributions of such forests. Selected areas of between 20-100 acres in size, containing timber of all size classes, often reveal a surprisingly well balanced diameter distribution following the law of de Liocourt, that is, following a straight line when plotted on semi-logarithmic paper. From such a graph the quotient as well as the diameter class containing exactly one tree can easily be determined. For subsequent analysis of the data it is more convenient, however, to determine the constants a and k of the equivalent distribution function $Y = k.e^{-ax}$. The variation in the position and slope of the lines obtained for different tracts indicate gradually differing structural types of all-aged forests, which to some extent correspond to different structures of even-aged forests for different rotations.

Balanced upland oak forests in central Pennsylvania reveal a quotient q varying between 1.4 and 1.8 Cubic foot volume per acre for trees 5 inches in diameter and larger varies between 1,600 and 2,500 cubic feet, while the normal volume of an even-aged forest of the same site quality managed on a 100 year rotation is equal to 1,900 cubic feet.[2] This figure is based on yield tables for untreated stands. With the application of intermediate thinnings, the calculated normal volume might well be considerably lower. A comparison between the normal volume of Swiss selection forests with the volume of even-aged forests[3] shows that on excellent sites the normal growing stock is somewhat higher in even-aged forests, but for average and poor sites the reverse is true. These studies seem to indicate that it is difficult at this time to arrive at any definite conclusions as to the relative amount of growing stock in even-aged and all-aged forests. As further data on the structure of all-aged southern pine forests become available, the possible balanced structures of these forests will become more definitely established.

H. Arthur Meyer
School of Forestry
The Pennsylvania State University

❦ ❦ ❦

At the risk of possibly seeming indifferent to the constructive thinking that R. R. Reynolds has compressed into his article, I want to point out a factor that might be overlooked by the hasty reader, tempted to find a wider application than the author intends.

In the second paragraph it is predicated that all the age classes in the theoretical even-aged forest occupy equal areas of land. In other words, a marked uniformity of site is a basic factor in the assumed situation.

That is certainly a forester's ideal, and one that may be present in the southern Arkansas and northern Louisiana country, where the terrain is rolling and the soil good. That is a good place to work out both the theory and practice of forest production. But what about the much larger areas of forest land where it may be hard to find as much as forty acres of uniformity in soil, slope, aspect and drainage?

Reynolds makes it quite clear that theory and practice do not coincide and his sudy has much value as an exploration in a field that is both new and difficult. From it fresh methods may be developed for the sort of forest where site and type may change several times in crossing a forty.

Herman Work
Consulting Forester
Staunton, Va.

[1] Reynolds, R. R. Growing stock in the all-aged forest. Jour. Forestry 52:744-748. 1954.

[2] Meyer, H. Arthur and William C. Keller. The normal growing stock of upland oak forests in Central Pennsylvania. Research paper No. 14, The Pennsylvania State University, School of Forestry. 6 pp. 1951.

[3] Knuchel, H. Planning and control in the managed forest. Oliver and Boyd, Edinburgh. 360 pp. 1952.

Reviews

The Practice of Silviculture

By Ralph C. Hawley and David M. Smith 6th edition. 525 pp. Illus. John Wiley & Sons, Inc. New York 16, N. Y. 1954. $7.50.

The sixth edition of this standard text, while rewritten in its entirety, follows the same pattern of the fifth edition, except for slight rearrangement of subject matter. Fresh material on biological and economic reasoning behind the subject matter has been added and helps in achieving clarity and showing the student the "why" after statements of principles.

An examination of the list of references discloses the tremendous growth in American silvicultural practice during the past decade; 678 references are cited as against 266 in the latest previous edition, clearly indicating the continuing advances in forest practices and technology. However, I find but 15 of these references being citations of published material since 1952. (13 in 1953 and 2 in 1954). Thus the student needs to be aware of the fact that while this text is a new publication, he still needs to pay attention to current literature and review and index material published since 1952.

The addition of photographs has aided in making this edition more attractive as well as interesting. Many of the pictures well illustrate the results of applying various cutting methods in actual practice.

The failure to include, in more detailed discussion, the advances made in the control of cuttings through the application of specific modifications of individual tree selection as illustrated by the work carried on in improvement selection, sanitation salvage, unit area control, etc., similar to the coverage given Dunning and Keen's classification, is disappointing. This is particularly true in the light of repeated reference to such work as Craib's in Africa which has no counter-part in the American scene, nor likely to have.

Recognizing that artifical regeneration plays an important part in the practice of silviculture, I nevertheless fail to see the necessity of including a chapter of 50 pages on this subject in this text book, presumably written for students who either have spent or are going to spend a semester's time studying seeding and planting. While the material presented is excellent, up to date, and in a very condensed form, it only serves as a filler.

The chapter on thinnings has been expanded to include more of the economic and mensurational aspects pertaining to the topic, pointing up the great importance of this form of intermediate cutting. The inclusion of material on prescribed burning and the use of silvicides is indeed welcome. More detailed illustrations describing work actually accomplished would have strengthened the presentation.

The failure to include reference to the pioneering work of Ehrhart and Bennett in the use of sodium arsenite in the discussion of the agent was, I hope, an oversight.

My students, using the text, are commenting favorably on its readability. They appreciate the very excellent bibliography following each chapter and praise the voluminous subject index as they find it a big time saver.

H. N. Cope
The Pennsylvania State University

The Wilderness World of John Muir

Edited by Edwin Way Teale. 332 pp. Illus. Houghton Mifflin Company, Boston, Mass. 1954. $4.50.

This book is both a biography and an anthology of John Muir, the eminent Scotch-American naturalist. It contains representative selections from Muir's 10 published books, together with brief introductions and explanations by Edwin Way Teale, the editor. Mr. Teale organized the material so as to give a runnning account of Muir's fascinating life and also present the best of his writings. The book is further enhanced by the trenchant beauty of Henry B. Kane's black and white illustrations.

Several men have written about nature surpassingly well, but John Muir was the wildest, the most daring, the most self-reliant, the most at home in the wilderness. He lived from 1838 to 1914 and during that time covered most of the American wilderness alone and on foot, without gun or sleeping bag, and with only a sackful of stale bread and tea.

On all these travels, Muir kept notes and journals that later became the basis for his books. His best known works are *The Story of My Boyhood and Youth, A Thousand-Mile Walk to the Gulf, The Mountains of California, My First Summer in the Sierra, Our National Parks, Travels in Alaska,* and *Stickeen.*

Out of his lifelong study of nature, Muir developed a mystical philosophy similar to that of Whitman and Emerson. Although he belonged to no church, much of his writing reflects a lofty spiritual concept of man's ultimate place in nature. Very few other men have loved all of creation with such ardor; or lived life with more enthusiasm; or felt their oneness with universe more deeply.

Although Muir distinguished himself in many ways — as a naturalist, an explorer, a scientist, and an author — even greater was his stature in the long fight for conservation. During those critical years around the turn of the century, his was the most eloquent and powerful voice raised in defense of nature. The Yosemite, the Grand Canyon, the Petrified Forests, and other park areas were established and preserved largely as a result of his influence.

For a man who did not enjoy writing, Muir wrote exceptionally well. But he looked upon his books merely as a means of sharing with others the glories of his wilderness

world. In his own words, he stated, "I have a low opinion of books. . . . No amount of word-making will ever make a single soul to *know* these mountains. As well seek to warm the naked and frost-bitten by lectures on calories and pictures of flame. One day's exposure to mountains is better than a cartload of books. See how willing Nature poses herself upon photographer's plates. No earthly chemicals are so sensitive as those of the human soul. All that is required is exposure, and purity of material. 'The pure in heart shall see God!'"

Likewise, a brief review is no substitute for a book such as this. I suggest you read *The Wilderness World of John Muir*. It contains a refreshing and inspiring message for all who feel the pressure, problems, and perplexities of our modern world.

ELMER W. SHAW

Planting the Southern Pines

By Philip C. Wakeley. 233 pp. Illus. Supt. of Documents, Washington 25, D. C. 1954. $2.75.

This publication, written by a recognized authority on planting southern pines, was first released in 1951 by the Southern Forest Experiment Station. It summarizes the available technical knowledge on planting, some of which has not previously been evaluated.

In view of the up-to-date technical information on all phases of plantation establishment, it is regrettable that information on the area needing planting later than 1933-1940 could not be obtained. During the planting season of 1952-1953, more than 420,000 acres were planted in the South, with private industry planting more than 383,000 acres. At the present time, more than 3 million acres have been planted in the South.

The publication notes the importance of fundamental decisions which should be made, before actual planting, regarding determination of plantable land, selection of species, choice of spacing, and means of procuring suitable planting stock. It is of utmost importance to choose a species well adapted to the local climate, site, and local pattern of fire, insects and disease. Each of the four major southern pines is discussed with regard to range, growth, site requirements and susceptibility to fire, insects and disease. Table 2 lists the regions and subregions with species recommendations for the various sites.

Seed is thoroughly discussed from collection of the cones through extract, dewinging, cleaning, drying, storage, testing, and planting. Extra care is recommended in handling seed because a reduction in germination percent materially increases the unit cost of seedlings produced. Tests are cited showing that seedlings from local seed sources are superior to seedlings from seeds obtained outside the region.

The section dealing with nursery practices covers site selection, layout, seed sowing, watering, weeding, injuries and their control, lifting, grading, packing, shipping, soil care, cost, and records. As southern pine seedlings are worth at least $3,000 to $5,000 per acre to produce, particular care should be exercised with this valuable crop. Good soil management is considered essential in order to get maximum production of plantable seedlings.

Mr. Wakeley states that the best planting techniques depend on correct choice of species, seed source, and spacing in relation to the planting objective and upon delivery of satisfactory nursery stock. As some failures may be unavoidable, they are best offset by budgeting funds for replanting land than by over-refinement of planting technique in an attempt to prevent all failures.

One of the most interesting sections is that dealing with plantation care. It describes plantation injuries and their control, replacement planting, pruning, and the first thinning. Plantations are said to be generally subject to worse and more varied injuries than natural stands. This section gives the available information on the nature and control of injuries and distinguishes between trivial and serious injuries.

In the first thinning, which is so important, it is said to be better to leave the right stand per acre than to obtain any particular yield. In the discussion of choice of trees to leave and to cut, it is stated that for saw timber, poles and piling, rapid diameter growth should be avoided, but for pulpwood only, rapid diameter growth might be desirable. Recent information from the Forest Products Laboratory contained in FPL report no. 1993, "Greater Pulp Yields Per Acre Per Year," indicates that very rapid diameter growth does not yield as much pulp as slower growth.

Descriptions of four experimental planting areas are given in the appendix. Safety rules for the use of insecticides, fungicides, baits, and repellents are also discussed. Detailed discussions are given for nursery practices, planting, and control of pocket gophers and Texas leaf-cutting ants.

Of particular importance is the list of cited literature comprising 811 items which makes this publication an excellent reference for all phases of planting Southern Pine.

V. W. COTHREN
Southern Pine Association

The Nation Looks at its Resources

Edited by Henry Jarrett. 418 pp. Resources for the Future, Inc., Washington 6, D. C. 1954. $5.

During November 2-4, 1953 the mid-century conference on natural resources was held in Washington, D. C. under the auspices of Resources for the Future, Inc., a subsidiary of the Ford Foundation, and under the sponsorship of a council of 18 distinguished citizens. The three-day meeting attracted an attendance of 1600 persons from all parts of America and from all walks of life. This is the report of the conference.

Actually, the conference consisted of eight smaller conferences, called sections, which were further organized into about 20 subsec-

tions. Neither in the meeting as a whole nor in any of its individual sessions were any programs for resources developed. It was not the purpose of the conference to recommend or endorse policies or actions. In theory, at least, the participants were there as indivduals for the purpose of discussion and information.

Numerous people who attended deplored the fact that no mechanism was set up for passing resolutions or for proposing action. With commendable prescience the conference steering committee had decided in advance against motions and resolutions. That this decision was wise soon became evident during the sessions. Several persons were noticeably articulate and positive in their opinions as to what needed to be done—as, for example, in forest management — without really having any technical education or practical experience with the resource about which they spoke with such confidence.

To be candid, a great deal of the discussion was repetitious, not particularly well informed, and often not germane to the subject. Henry Jarrett and his editorial staff deserve credit for having winnowed out most of the chaff. The verbatim transcript of the conference totalled 5,000 pages which for this report was reduced to 1,000!

While commending the editors for the good cutting job they did, one could wish they had done more. A good deal of foggy thinking is apparent, and even statements have been allowed to stand that are plain nonsense. As for example, this gem from Anthony W. Smith of the C.I.O., "We are still cutting our timber at the rate of three trees for every two trees grown."

The truth is that the report contains a considerable amount of comment that it is simply a waste of paper to print. Like the statement of the woodland owner in Tennessee who took up the time of the section conference to complain that he sold some timber but did not get as much for it as he thought he should. So he criticizes the government and the forestry profession, and his triade is printed. Who cares?

In the introduction, Dr. R. G. Gustavson, president of Resources for the Future, Inc. explains that "Many of those who took part in the discussions were experts, including some of the most distinguished in their respective fields. Others were laymen with deep interest in resource problems and something worth while to say about them, who would quite cheerfully acknowledge their lack of technical background. Not all of the record, therefore, can be termed a handbook of current scientific opinion. Some statements probably would not stand up under expert analysis."

From the human interest standpoint the document is fascinating because it reveals the wide diversity of opinions as to how our resources should be handled. In the timber and forest products section, those with the deepest knowledge and the largest experience were reluctant to imply that they knew all the answers. On the other hand certain individuals, less knowledgeable and manifestly less modest, had the solutions down pat.

In the pages of this report hundreds of people have made statements and expressed opinions on hundreds of subjects. Some of the statements are perfectly sound and valid, as are in truth many of the opinions. But the casual reader—our mythical man in the street—is going to have a hard time determining which is which.

HENRY CLEPPER

Those of the Forest

By Wallace Byron Grange. 314 pp. Illus. Flambeau Publishing Co., Babcock, Wis. 1953. $4.75.

This factual, very readable, and highly interesting philosophical book is enlivened by first-hand observations which are indicative of the author's obvious wealth of experience. With the snowshoe rabbit as the central figure, it emphasizes the intimate relationship and the inter-dependence of all things in nature.

Although, to this reviewer, it seemed to start slowly, *Those of the Forest* became increasingly interesting as the reading of it progressed, and as the primary theme of the book unfolded.

To those who have experience and interest in the outdoors this book should provide very pleasurable reading.

C. FRANK BROCKMAN

Publications of Interest

How to Get the Most from Your Binoculars, an article appearing in a recent issue of *Fire Control Notes*, is available in reprint form from The Reicherts, Mirakel Repair Co., Mount Vernon, N. Y. The reprint gives practical instructions on the care and use of binoculars and will prove useful to outdoor workers.

* * *

An Economic Viewpoint on Pacific Coast Forest Planting, by Henry J. Vaux, is a publication of the University of British Columbia, Vancouver, Canada. Mr. Vaux is professor of forestry at the University of California and presented the material given in this pamphlet as an H. R. MacMillan Lectureship Address at the University in November, 1954.

* * *

Almost every problem confronting the small sawmill operator from where and how to set up a sawmill to how to saw logs with stringy bark, is covered in *Small Sawmills, A Pocket Guide*, published by the U. S. Forest Service, Forest Products Laboratory at Madison, Wis. This 28-page pocket-size reference is prepared for operators, foremen and workers of small mills.

The guide suggests not only how to set up the mill and fit the saw, but how to check the mill for mechanical fitness, how to sharpen saw teeth, and how to determine proper saw and feed speeds. It discusses what causes the faulty sizing of lumber and how to correct it. It concludes with solutions to special sawing problems that most operators have to meet sometime, such as: how to handle outsize logs; small, knotty logs; low-grade logs; and frozen timber or very hard woods.

The guide, prepared by C. J. Telford, a small sawmill specialist at the Forest Products Laboratory, is Agricultural Handbook No. 70. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. at 15c.

Current Literature

Compiled by MARTHA MEELIG, *Librarian, State University of New York College of Forestry*
Range Management Section Compiled by FRANCES FLICK, *Library, U. S. Department of Agriculture*

General

Black Walnut. By H. S. Betts. 8 pp. U. S. Forest Serv., Washington 25, D. C. 1954. American Woods (rev.) 5 cents (Govt. print. off.)

Great River, the Rio Grande in North American History. By Paul Horgan. 2 vols. Illus. Rinehart, New York. 1954. $10.00.

Incense-Cedar. . . . By H. S. Betts. 4 pp. U. S. Forest Serv., Washington 25, D. C. 1954. American Woods (rev.) 5 cents (Govt. print. off.)

The Southern Pines. By H. S. Betts. 13 pp. U. S. Forest Serv., Washington 25, D. C. 1954. American Woods (rev.) 10 cents (Govt. print. off.)

Sweetgum. By H. S. Betts. 8 pp. U. S. Forest Serv., Washington 25, D. C. 1954. American Woods (rev.) 5 cents (Govt. print. off.)

Farm Forestry

Forest Farmer Manual. 200 pp. Illus. The Forest Farmers Ass'n., P. O. Box 7284, Sta. "C," Atlanta, Ga. 1954. $3.50.

Marketing Farm Woodlot Products in Franklin, Osage, and Gasconade Counties. By R. C. Smith. 27 pp. Illus. Missouri Agric. Expt. Sta., Columbia. 1954. Bul. No. 623.

Forest Economics

Area and Ownership of Forest Land in San Mateo County, California. By H. L. Baker and Adon Poli. 22 pp. Illus. California Forest and Range Expt. Sta., Berkeley. 1954. Forest Survey Release No. 22. Mimeog.

Christmas Trees in California 1953; Shipments, Production, Marketing. By Woodbridge Metcalf. 20 pp. Univ. of California Agric. Ext. Serv., Berkeley. 1954. Mimeog.

Forest Management

Initial Management Plan for Pilot Plant Unit on Kaskaskia Experimental Forest. By L. S. Minckler. 31 pp. Central States Forest Expt. Sta., Columbus, Ohio. 1954. Mimeog.

Forest Resources

Forest Statistics for New York District(s) 6, 8, 9, 10. Northeastern Forest Expt. Sta., Upper Darby, Pa. 1954. Forest Stat. Ser.: New York. Nos. 7, 8, 9, 10.

Forest Statistics for the Glaciated Region of Ohio. 33 pp. Central States Forest Expt. Sta., Columbus, Ohio. 1954. Forest Survey Release No. 16. Mimeog.

Forest Statistics for the Hill Country of Ohio. 44 pp. Central States Forest Expt. Sta., Columbus, Ohio. 1954. Forest Survey Release No. 17.

Logging and Milling

Full-Tree Logging—A Challenge to Research. By A. Koroleff. 112 pp. Illus. McGill Univ. Bookstore, Montreal, Quebec. 1954. $3.50.

The Kiln-Drying of British Columbia Lumber. By J. H. Jenkins and F. W. Guernsey. 79 pp. Illus. Canada Forestry Branch, Ottawa. 1954. Bul. No. 111.

Red Alder Log and Lumber Grading. By J. R. Pfeiffer. 7 pp. Tables. Oregon Forest Products Lab., Corvallis. 1954. Rept. No. G-3. Mimeog.

Seasoning California Hardwoods. By H. H. Smith. 18 pp. California Forest and Range Expt. Sta., Berkeley. 1954. Tech. Paper No. 5. Mimeog.

Small Sawmills; A Pocket Guide. By J. C. Telford. 26 pp. Illus. U. S. Dept. of Agric., Washington 25, D. C. 1954. Agric. Handbook No. 70. 15 cents (Govt. print. off.)

Protection

Common Pine Insects of Texas. By W. H. Bennett. 3 pp. Texas Forest Serv., Gulfport. 1954. Mimeog.

Forest Insect Conditions in the Northeast —1953. By W. E. Waters and T. McIntyre. 17 pp. Northeastern Forest Expt. Sta., Upper Darby, Pa. 1954. Station Paper No. 72. Mimeog.

Table of Identification for Texas Forest Insects. By W. H. Bennett. 3 pp. Texas Forest Serv., Gulfport. 1954. Mimeog.

Range Management

Agronomic Research in Grassland Husbandry Problems. By R. Holliday. Agricultural Progress, Shrewsbury, Eng. Vol. 28, Pt. 2, pp. 109-123. 1953. 35 cents.

Controlling Sagebrush on Range Lands. By J. F. Pechanec and Others. 36 pp. Illus. Supt. of Docs., U. S. Govt. Print. Off., Washington 25, D. C. U. S. Dept. of Agric., Farmers' Bul. No. 2072. Oct. 1954. 20 cents.

Forest Grazing; Principles of Management. Unasylva. Food & Agric. Organ. of the United Nations, Rome, Italy. Vol. 8, pp. 59-65. Illus. June 1954.

Range Improvement Through Water Spreading. By C. M. Stokes and Others. 36 pp. Illus. Supt. of Docs., U. S. Govt. Print. Off., Washington 25, D. C. 1954. 30 cents.

Silviculture

The All-India Teak Seed Origin Sample Plots. By G. S. Mathauda. 14 pp. Illus. Manager of Publications, Delhi. 1954. Indian Forest Bul. No. 177. From Indian Forester Vol. 80, No. 1. 1Sh.6d.

Behavior and Control of Understory Hardwoods After Clear Cutting a Piedmont Pine Stand. By E. V. Brender and T. C. Nelson. 17 pp. Illus. Southeastern Forest Expt. Sta., Asheville, N. C. 1954. Station Paper No. 44. Mimeog.

L'hybridation entre les Pins Mediterraneens et son Influence sur la Gemme, surtout en Grece. By J. C. Papainnou. 10 pp. Study presented at the 4th Session of the Subcommission on Coordination of Forestry Problems held at Athens June 1-15, 1954.

Planting Depths and Methods Experiments. By R. E. Mullin. 26 pp. Ontario Dept. of Lands and Forests, Toronto. 1954. Research Rept. No. 26. Processed.

Scarification in Engelmann Spruce-Alpine Fir Forests. By J. D. Clark and L. W. W. Lehrle. 7 pp. Illus. British Columbia Forest Serv., Victoria. 1954. Research Notes No. 25.

Wood Preservation

The Air-Drying and Pressure-Impregnation of New Zealand Crown Larch . . . Douglas-Fir . . . and Corsican Pine . . . Natural Round Fence Posts. By D. R. Carr. Pp. 482-497. New Zealand Forest Research Inst., Wellington. Tech. Paper No. 2. From New Zealand Jour. Sci. & Tech. May 1954.)

Wood Technology and Utilization

Anatomy of Common North American Pulpwood Barks. By Ying-Pe Chang. 249 pp. Illus. Technical Ass'n. of the Pulp and Paper Industry, New York. 1954. TAPPI Monograph No. 14.

Inside Wood—A Short Trip into the Interior for the Layman. By F. J. Champion. 4 pp. Illus. U. S. Forest Products Lab., Madison, Wis. 1954. Rept. No. 1995. Mimeog.

Yellow Cedar; Its Characteristics, Properties, and Uses. By R. S. Perry. 19 pp. Illus. Canada Forestry Branch, Ottawa. 1954. Bul. No. 114.

Society Affairs

Officers and Members of the Council, 1954-1955

E. L. DEMMON, *President*
Southeastern Forest Experiment Station
Federal Building
Asheville, N. C.

WILLIAM J. BROWN
Woodlands Department
Kimberly-Clark Corporation
Neenah, Wis.

C. HUXLEY COULTER
Florida Forest Service
Tallahassee, Fla.

D. B. DEMERITT
Dead River Company
6 State Street
Bangor, Me.

DEWITT NELSON, *Vice President*
Department of Natural Resources
State Building 1
Sacramento 14, Calif.

STANLEY G. FONTANNA
School of Natural Resources
University of Michigan
Ann Arbor, Mich.

PERCY D. HANSON
U. S. Forest Service
Federal Building
Missoula, Mont.

EDWIN F. HEACOX
Weyerhaeuser Timber Company
Tacoma 1, Wash.

HENRY CLEPPER, *Executive Secretary*
Mills Building, 17th Street at Pennsylvania Avenue, N. W.
Washington 6, D. C.

JOSEPH S. ILLICK
State University of New York
College of Forestry
Syracuse 10, N. Y.

J. HERBERT STONE
U. S. Forest Service
729 N.E. Oregon Street
Portland 8, Ore.

RUTHFORD H. WESTVELD
Department of Forestry
University of Missouri
Columbia, Mo.

Report of Officers, Staff, Committees, Council Meeting, and Divisions

Fifty-fourth Annual Meeting, Society of American Foresters
Milwaukee, Wis., October 24-27, 1954

President's Report 1954

E. L. Demmon

First let me say that I have appreciated the opportunity of serving as your president during 1954. With the excellent cooperation of the Council members and your efficient staff in Washington I believe that we are carrying on effectively the objectives set up by our founders in 1900, namely (1) to represent, advance and protect the interests and standards of our profession, (2) to provide a medium of exchange for profesisonal thought, and (3) to promote the science, practice, and standards of forestry in America. This does not mean that there is no room for improvement, nor that all of our more than 10,000 members are perfectly satisfied with the Society. Your officers, however, are working assiduously to the end that this professional forestry organization can better serve its members and adequately represent the profession before the public.

It is a pleasure to meet with you in Milwaukee, as my early days and a good share of my professional life were spent in this part of the country. It is like coming home again after an absence of several years, to mix with old friends and associates and to make new acquaintances. And incidentlly, this is the 16th annual meeting of the Society that it has been my good fortune to attend. The excellent program arranged by your local committee will give us all an opportunity to get up to date on "Our Changing Forests."

The annual Society Affairs session was held in the Crystal Ball Room of Hotel Schroeder at Milwaukee in the afternoon of October 25. President E. L. Demmon presided.

The Council met October 24, preceeding the opening of the Annual Meeting.

The reports which follow indicate the scope of the activities of the Society in behalf of the profession, and the members are urged to read them.

Since taking office last January I have kept in touch with Society business and Section activities through attendance at a number of Section meetings and by periodic visits to our Washington office. During these past 10 months I have had the pleasure of meeting with seven different Sections—Appalachian, Southeastern, Gulf States, Kentucky-Tennessee, New England, Columbia River, and Puget Sound—and have conferred with our staff in Washington on six separate occasions.

I was well pleased with the high type of technical programs arranged for the Section meetings. It seems to me that Section and Chapter activities are vital to the strength of our organization. It is here that the greater proportion of our members can take an active part in Society affairs and participate in technical forestry discussions. I commend the further organization of local Chapters so that a larger proportion of our members, particularly the younger men, will have opportunities to get together frequently and become better acquainted with one another's problems.

Your Washington office has moved into new quarters during the year,

which has made for a more efficient functioning of the staff. The Society's fiscal affairs are in good shape; we are operating in the black, even though costs have increased all along the line. But there are additional services that could be given if we were in a stronger financial position. Our advertising revenue in the JOURNAL has increased significantly in recent years. However, the major portion of our income is and will continue to be from member dues.

After a careful study of our finances I do not feel that it would be wise at this time to recommend any increase in dues. Many of our members have told me that by increasing dues we would lose members. In fact, some members have dropped out because they felt they could not afford to pay the present dues. In many cases I believe this was more of an excuse than a legitimate reason for dropping their membership. Many other professional organizations have higher dues than ours. However, I feel that if the Society can continue to show that it is a live and progressive professional organization, serving our members well, we can attract a greater proportion of the potential membership to join our ranks. This would help our financial situation, as our present officers and staff could adequately service additional membership. I am pleased to say that membership has been increasing, as our executive secretary will report later on. But this does not mean that we should be satisfied, when so many qualified foresters are not now members.

How can we give more services to our members? I will mention a few of the projects now under way or proposed which should better promote forestry in America and incidentally strengthen the Society as an organization serving the public interest.

Our JOURNAL OF FORESTRY will continue to be our best medium for exchange of professional thought. However, the Council has agreed to support the publication of a new journal, *Forest Science* (quarterly) by contributing business and similar services, with the understanding that the financial obligations will be underwritten elsewhere. This new journal will take some of the backload off the JOURNAL OF FORESTRY by publishing highly scientific articles of interest to only a limited number of Society members and also publish lengthy articles of a fundamental nature which our JOURNAL OF FORESTRY cannot accept.

During the coming year we can look forward to seeing in print two major Society publications: the *Forestry Handbook*, formerly designated *The Foresters' Field Manual*, which has been in process of preparation for several years through the contributed efforts of many Society members; and *Forestry and Related Research in North America*, made possible through a grant from the Rockefeller Foundation. Others on the program will give you additional details on the status of these publications.

Additional Society services will include the publication of the Proceedings of this annual meeting, which will be made available to the members at cost and which is covered in your registration fee here; and a new Membership Directory, the first in five years.

I am hopeful that the cost of the *Forestry Handbook* can be kept sufficiently low so that all members can afford a copy. This handbook promises to be a most useful tool to every practicing forester as well as a useful reference work for forestry school students.

Let me commend the membership chairmen of the Sections for the fine work they have done on the Membership Campaign during this year. The Forestry School faculties have also done yeoman service in explaining the advantages of membership to eligible students. Even with all these good efforts we have still failed to bring in many foresters eligible to be members. Another source of regret is the considerable number of members who are dropped each year for failure to pay current dues. If the Society is failing in some way to make membership attractive to these men, let us examine wherein we may have fallen down. It has been said that one profits from an organization in proportion to the extent he contributes to it. Then it is up to each of us to keep high standards and to work for the Society and the profession so that the public will recognize us as professional men.

During the year I have followed the custom initiated by my immediate predecessor, George Drake, in preparing a monthly column for the JOURNAL, commenting informally on matters which I considered might be of interest to the membership. Since these columns have failed to elicit any comments, possibly I have failed to make them interesting or worthwhile. However, they give me an opportunity to pass on to the readers some of my thoughts and ideas on how the Society can be made more useful to its members, to the forestry profession, and to the public. Therefore, unless I hear objections, you may expect a continuation of these informal columns during the coming year.

And now we will go on to the reports of your executive secretary, editor, and committee chairmen. In closing, let me pledge you again my wholehearted desire to continue to serve the Society to the best of my ability. I am sure that this also expresses the desires of the officers and Council.

Report of the Executive Secretary

Henry Clepper

Ever since its formation 54 years ago, the Society has never hesitated to be spokesman for our profession. In helping to establish standards in our professional education, research, ethics, literature, and numerous other aspects of our professional life, the Society has been the voice of American forestry whenever it was necessary or desirable to speak up. But although the Society has been the voice, the members themselves have always represented the will directing what is said.

My duties over the years have brought me into intimate contact with numerous technical, professional, and scientific societies, and I have been afforded opportunities to observe the manner of their operations. No similar organization that I know of has officers and directors as responsive to the wishes of their members as our own Society. Any member with a suggestion or criticism has direct access to his Chapter officers, his Section officers, or the Council at the national level.

And that's one reason why this Society Affairs session is an important part of our annual meeting. Here the youngest Junior Member has the same privilege of discussing Society business as the most eminent Fellow.

Education

During the past year one additional school of forestry came into existence when Mississippi State College went on a four-year undergraduate basis leading to a degree. Previously this institution offered a nonprofessional curriculum in forestry.

As of October 24 there is one additional accredited school. On recommendation of the Committee on Accrediting, and with the approval of the Council, Louisiana Polytechnic Institute at Ruston is now accredited.

Thus there are now 26 colleges and universities accredited for professional forestry instruction, and 10 additional

TABLE 1.—FIVE-YEAR COMPARATIVE STATEMENT OF INCOME AND EXPENSE

Year	Income: Dues & fees	Income: All other	Income: Total	Total expense	Average membership	Per member cost (total expenses)	Per member cost (adjusted)	Annual dues (range)	Net earnings	Investments (general fund)
1949[1]	$65,877	$15,293	$ 81,170	$ 79,430	6456	$12.30	$ 9.83	$6–$15	$1,740	$21,132
1950	$72,035	$20,406	$ 92,441	$ 93,890	6844	$13.75	$10.76	$3– 15[2]	—$1,449[3]	$11,497
1951	$76,560	$23,518	$100,078	$ 95,452	8252	$11.56	$ 8.71	$3– 15	$4,626	$10,556
1952	$80,709	$25,916	$106,625	$105,437	8995	$11.78	$ 8.85	$3– 15	$1,188	$19,156
1953	$84,475	$33,283	$117,758	$115,570	9457	$12.22	$ 8.70	$3– 15	$2,188	$16,156

[1]Effective date of last dues increase.
[2]Student Member grade initiated at $3 annually. No admission fee required. Advancement made to Junior grade without additional dues payment for remainder of year.
[3]Deficit.

institutions offering instruction on a professional level but not meeting the standards of accreditation.

With 36 institutions of collegiate rank now offering professional curriculums in forestry, many forestry educators believe that the nation and the profession is adequately served. In short, there are sufficient educational facilities to meet the prospective demand for professional foresters, certainly for the next decade at least.

Membership

A membership campaign aimed at 1,000 new members in 1954 was approved by the Council at its meeting a year ago. To obtain a net increase of 1,000 new members required at least 1,500 applications for the entering grades to offset losses by resignation, arrears of dues, and death.

Despite yeoman efforts by the Section membership committees, and in particular by the faculty representatives at the accredited schools, we failed to meet the quota by nearly 50 percent.

For the first time in the Society's history we reached a total membership of 10,000, which was a secondary goal of our membership campaign. However, we shall not be able to hold this figure at the end of the fiscal year (November 30) because it will be necessary to drop about 400 members who are delinquent in dues. Partly offsetting this loss will be about 200 or more new members, mostly in the Student grade, who will join during October and November.

We confidently expect to hit 10,000 again in the first half of 1955, and should be able to hold this figure as a minimum throughout 1955.

During the fiscal year 1954, 885 membership applications for entering grades were received; 497 were Student Member applications. Including reinstatements and advancements in grade, 1,683 applications were processed during the year.

When quotas were established for each Section it was realized that some Sections would have difficulty meeting them. All Sections did well, especially the Inland Empire, Northern Rocky Mountain, and Upper Mississippi Valley Sections, which met their quotas. The Ozark and Southeastern Sections almost made their quotas.

For example, the Southeastern Section, the largest numerically, had the largest quota—145. From this Section were received 128 applications for entering grades.

Finances

Our estimated total income during the fiscal year 1954 is about $125,000. Of this amount the largest sources are from membership dues and admission fees, about $88,000. The next largest item of income is advertising, $25,000. But mind, you, this advertising revenue is gross income, not net.

Our estimated expenses for 1954 are $120,000, and our net income for the year will be just under $5,000. Other than salaries of the executive and office staff, amounting to about $47,000, the largest item of expense is still the JOURNAL OF FORESTRY, the cost of which is nearly $40,000. To sum up, the Society is operating in the black.

A complete breakdown of all income and expense for 1954 together with the budget for 1955 will be published in the February JOURNAL. Let me emphasize that the financial standing of the Society is always available to the membership. Our annual budget is published at least once a year; usually oftener. For example, a table showing actual income and expense for 1953 together with the current 1954 budget was published in the August JOURNAL in connection with the report of the midyear Council meeting.

As many members, though perhaps not all, know, our accounts are audited twice each year by a firm of certified public accountants who report direct to the president and Council.

Again I want to commend the efficient services rendered by Miss L. A. Warren, our faithful business manager, and the capable office staff. To Miss Warren, more than any other person, is due credit for the sound and business-like management of our fiscal affairs.

In May of this year I rounded out 17 years of service to the Society and the profession. From the beginning it has been, and continues to be, a pleasure to serve the Society, and I thank you for that privilege.

Report on Advertising

During the 5½ years I have been associated with the JOURNAL OF FORESTRY as advertising representative, the publication has made fine progress in circulation and editorially. While I can claim no credit in these two departments, I am proud of that progress and unhesitatingly say that it has a very favorable bearing on advertising progress. Statistically, this story of progress, increased income per page; is summarized in Table 1.

Rates approximately 20 percent higher were made effective with the March 1954 issue. Not all contracts were immediately subject to the increase. However, beginning with the January 1955 issue, all business will be on the current rate schedule.

The retainer fee, paid to me for a time for certain pioneering and the preparation of promotional material, was entirely discontinued early in the year by mutual agreement.

The higher page rate and the increasing volume, plus the discontinuance of the retainer, should improve the Society's net return from advertising.

Our experience in obtaining contract renewals has been quite good, but there are, of course, exceptions. In general, we are now fairly well known as an advertising medium with many prospective accounts and their advertising agencies. In 1955 we will endeavour to hold present business—some very good renewals are already in hand—

TABLE 1.—AVERAGE GROSS ADVERTISING REVENUE PER PAGE PER YEAR

Year	Number of pages	Total advertising gross volume	Average gross income per advertising page	Average gross volume per issue
1950	117	$11,616	$ 99.28	$ 968
1951	146	14,600	100.00	1,216
1952	173	20,078	116.05	1,673
1953	202	25,931	123.42	2,161
1954	191	27,018	141.41	2,253

increase space where possible, and to seek accounts in some categories where as yet we have been unsuccessful, e.g., trucks, steel strapping, tires, etc.

The long range aspect is particularly good. The recently released report by Stanford Research Institute, of a study sponsored by the Weyerhaeuser Timber Company, Tacoma, Washington, and entitled "America's Demand For Wood—1929-1975" is potent testimony that there will be more professional foresters in the woods with much more authority in the next two decades. That is good selling ammunition for the JOURNAL OF FORESTRY and it will be exploited fully and, we believe, profitably.

To Henry Clepper, again my appreciation for the confidence placed in me. To Miss Audrey Warren, high praise for her very efficient, prompt and cooperative handling of affairs at her end. To Arthur Meyer, my compliments for his methodical building of the JOURNAL OF FORESTRY into an increasingly useful and attractive publication to serve the Society's members.

LLOYD THORPE
Advertising Representative

NOTE: Gross revenue represents income before deductions for commissions and agency discounts; the net cash revenue is less than half (*Managing Editor*).

❦❦❦

Report of the Editor

Arthur B. Meyer

They tell us that work for its own sake has many rewards. This is doubtless a good piece of philosophy, but no minor part of the reward comes in being able to say that the work is done. This has been a busy year for those of us concerned with Society publications and it is of considerable satisfaction to me to be able to report that during this year the cover type bulletin was published and the forester's manual brought to its final stages, in addition to getting out 12 issues of the JOURNAL, one of them a special issue.

Cover Type Bulletin

The 68-page bulletin, *Forest Cover Types of North America*, became available in April. It was prepared by the five-man Committee on Forest Types, aided by a companion group from the Canadian Institute of Forestry. It describes the forest types of the United States, Canada, and Alaska, and is a revision and combination of two previous bulletins dealing with the types of the eastern United States and of western North America.

Work on this project by our staff was mainly routine in nature except for one item that slowed us up. Just about the time final editorial work on the bulletin was started, the Forest Service came out with its new *Check List* and it was necessary to correlate nomenclature in the bulletin with that in the new list. There were quite a few tree names mentioned in the bulletin.

This publication sells for $1. As of October 1, about 1,000 copies had been sold and it can be assumed that it will have a slow but steady sale in the future.

Forester's Manual

Nearly half our time this year has been devoted to the Forester's Manual. Details of the history—you might say, evolution—of this book are available in records of the Society. There is, therefore, no need to go into them in detail, but I would like to point out again that this undertaking is one of considerable magnitude and long duration and has involved a lot of people.

Ralph R. Hill first suggested in 1946 that the Society compile a manual for foresters. He was appointed chairman of a committee to explore the possibilities, and the committee reported favorably on the project at the 1947 Society meeting. Following approval of this report, the Council authorized the appointment of an editorial committee and 19 subject-matter committees to undertake compilation of the material, and authorized the employment of Reginald D. Forbes, a consulting forester, to serve as technical editor.

Preparation of this manual has covered a span of six years. It represents the work and ideas of more than 100 persons who are listed on the several committees, and of at least 100 others who contributed or reviewed material. It presents the formulas, tables, converting factors, and related basic information most likely to be used by foresters of United States and Canada in practicing on-the-ground forestry. It is assumed that those who use it will have had previous technical training. Although designed for the general practitioner—or perhaps because it is so designed—it contains as much coverage as space would allow for such specialized subjects as watershed management, recreation, wildlife management, and forest-range management. It is intended primarily to meet the needs of field men or foresters working at field headquarters, but because of its nature t should also serve as a source of ready reference in the office.

A publication contract for this book was signed with Ronald Press Company of New York last April. This company and two other leading publishers had expressed interest in the book on seeing sample portions previously. Final selection of Ronald was made on the basis of its record as a publisher of manuals and textbooks, on its indication of minimum further requirements to put the manuscript into shape for acceptance, and on generous provisions for financial returns to the Society for book sales.

On the urgent recommendation of Ronald Press, with the Council's approval, the book's title has been changed to *Forestry Handbook*, on the basis that this more clearly represents its scope and usefulness than does the slightly more restrictive meaning of "manual."

The *Forestry Handbook* is scheduled for appearance in May. It will be in manual form—that is with limber back and thin paper—and will have approximately 1,290 pages. The selling price will not definitely be determined until later, but it is only realistic to recognize that it cannot be a low priced book for the simple reason that by the time it was completed it was a quite ambitious creation. Ronald has indicated that there will problaby be a price to students below the regular selling price.

During the years of its preparation the Council has authorized the expenditure of $9,500 toward completion of this book. How much of this fund will be returned to the Society's coffers only time will tell, but our contract with the publisher calls for a royalty payment

to us of 20 percent of the price received by the publisher for each book sold. Our success will depend to a large degree on use of the handbook by our members and its promotion for other potential users, for it has a certain, though limited, market outside the profession.

Needless to say we all fervently hope that the book will be well received, that it will be judged of material value to forestry, and that it will be financially successful. It can be further hoped that by periodic revision and improvement the *Forestry Handbook* will become a standard in its field, comparable to Gray's *Manual of Botany*, or the *Handbook of Chemistry and Physics*.

Journal

When I think of comparing the publication of the JOURNAL OF FORESTRY with the foregoing book and bulletin I am reminded of the difference between a lake and a segment of a river. Getting out the JOURNAL is a continuing operation, a flowing process like an assembly line. Work during one month may readily involve six or more issues. You have to measure trends rather than clearly defined and consistent requirements and problems.

There is one problem that I have harped on every time anyone would listen during my two year's connection with the magazine—that is, our large backlog of unpublished articles. It has kept getting larger and, so far as I can tell, is currently larger than it has ever been in the Society's history. There has, however, been a development that will help toward solving this. In May the Council approved publication of separate proceedings of this annual meeting, rather than their appearance in the JOURNAL. This does not reduce our present backlog. It does mean, though, that it will not be doubled. That would have resulted in a 20-month average delay between acceptance and appearance of an article.

I am dwelling on this once again because it points up some of the difficulties we have faced in the past, and because we can envision some favorable trends if we can take this opportunity to work out from under the problem. We can make the JOURNAL of wider interest and greater value to the professional reader.

Look at it this way. We now have a 10-month backlog. However, during the past year the rate of submissions began to fall off. It dropped about 20 percent—to the point where it about equalled the rate of our publication of articles. As about 20 percent of submissions are not published, this means we are now in a position to be able, gradually, to drain off the backlog. If we can get it down to about 6-months-size we will be in a considerably healthier situation. The editorial board will make every effort to hold this line, and to better it with more stringent selection and careful editing for brevity. It may also be that the forthcoming publication of *Forest Science* will absorb some material otherwise channelled to the JOURNAL.

I am taking an optimistic view of present trends. I am very hopeful that publication of separate proceedings will be found desirable and financially possible in the future. If so, I feel we are now in a position to work more successfully toward three goals we have had in mind. These are:

First: Greater timeliness, so that technical developments or current policy matters may be reported more quickly.

Second: Greater freedom to take material at hand and mold individual issues for their greatest individual interest and value, without the responsibility of publishing articles that have waited unduly long for appearance, even though their insertion makes an unbalanced issue.

Third: More leeway and incentive for the editors to solicit special articles and ones on subjects inadequately covered by regular submissions.

Work toward these three goals will, I hope, be furthered also by the fact that we now have the *Forestry Handbook* about cleared away, so that the future will permit the staff more time to concentrate on the JOURNAL.

A GROUP OF JOURNAL EDITORS. *L* to *R*, seated, Harvey J. MacAloney, *forest pathology and entomology;* Philip C. Wakeley, *forest genetics and artificial regeneration;* S. R. Gevorkiantz, *mensuration.* Standing, S. H. Spurr, editor of the proposed journal *Forest Science;* Marvin D. Hoover, *forest influences and soils;* Arthur B. Meyer, editor of the JOURNAL OF FORESTRY; and John W. Duffield, *silviculture.*

The Proposed Journal of Forest Science

A new journal, *Forest Science,* will appear in the first quarter of 1955. This quarterly journal of research in forestry is a cooperative venture involving the Society of American Foresters, and forest research and educational organizations generally.

The appearance of the new journal climaxes several years of discussion and planning on the part of members of the Society. A special committee of the Division of Education reported favorably on the project at the Colorado Springs meeting in September, 1953, and referred the matter to the Council of the Society. At its spring meeting held in Ann Arbor in June, 1954, the Council agreed to cooperate with the proposed journal to the extent of making its business and editorial facilities available, but without undertaking financial contributions for the support of *Forest Science.*

In September, 1954, a grant of $2,000 was made available through the Horace H. Rackham Fund of the University of Michigan to provide an initial operating fund for the new journal. This has cleared away the last obstacle to the appearance of the new journal and plans for its early appearance are well under way.

The journal will be under the control of a three-man board of editors: Henry Clepper, executive secretary of the Society of American Foresters; V. L. Harper, assistant chief (forest research), Forest Service, U. S. Department of Agriculture; and Stephen H. Spurr, professor of silviculture,

School of Natural Resources, University of Michigan. The last-named will serve as chairman of the board of editors. In addition, editorial correspondents will be named to represent cooperating forest research and educational organizations.

The policy of the journal will be to accept papers of high quality which are more of interest to research, teaching, and administrative personnel than to the entire membership of the Society. The coverage will be broad, and papers on any forestry subject may be accepted. Articles may be of any length, but a subsidy will be needed to publish the longer papers. In general, preference will be given to articles discussing the results of original research. However, review articles, discussion articles, and book reviews—particularly of foreign books—will also be welcomed.

It is the intention of the board of editors to avoid competition in any sense with existing journals. If any papers are received that appear to be better suited to the JOURNAL OF FORESTRY or any other existing journal, the editors will recommend to the author that the paper be resubmitted to the suggested journal.

The success of a scholarly publication in forest research depends upon the support such a journal receives from the forestry profession. A paid circulation of about one thousand will be needed to insure financial success. Institutional and library subscriptions are not in themselves sufficient in number to permit the journal to achieve this circulation. Individual research workers, teachers, and industries must subscribe to the new journal in order to secure its financial success. In addition, it is hoped that organizations having publication funds available will underwrite whenever possible the cost of articles by their authors.

Furthermore, special issues of *Forest Science* can be subsidized at any time by qualified research organizations. Thus a research organization may obtain the advantages of a serial publication, lower printing costs, and fast, early appearance by underwriting a special issue of *Forest Science*. Such issues will be distributed without charge to subscribers and will be in addition to the four quarterly issues guaranteed. Net income from additional sales of special issues, however, would revert to the subsidizing organization.

The Board of Editors of *Forest Science* believes that the forestry profession has progressed far enough and is mature enough to support a scholarly publication in forest research. With over 1,400 forestry graduates currently $45 million a year being spent in the United States alone for forestry and related research, an international publication medium is clearly called for.

The editors hope that *Forest Science* will serve to stimulate fundamental research in the field of forestry, will give added prestige to the status of research and research workers in this field, and will serve to centralize important research information now disseminated in a large number of minor journals and lithoprinted serials.

STEPHEN H. SPURR
School of Natural Resources
University of Michigan

Forestry and Related Research in North America: A Progress Report

The Society of American Foresters' Forestry Research Project is nearing completion. The report *Forestry and Related Research in North America* will be published in book form early in 1955.

The study had its inception at a May, 1951, meeting of the National Research Council's Division of Biology and Agriculture. The proposal for such a study was presented by E. L. Demmon, representative of the Society of American Foresters to the National Research Council's Division of Biology and Agriculture, and Henry Clepper, executive secretary of the Society.

A quarter-century had elapsed since the study *A National Program of Forest Research*, by the Washington Section, Society of American Foresters, a study that culminated in the passage of the McSweeney-McNary Forest Research Act of 1928. In 1929 was published the first full-scale, nongovernmental study, *The Role of Research in the Development of Forestry in North America*, financed by the General Education Board of the Rockefeller Foundation on the recommendation of the National Academy of Science.

The year 1953, the 25th anniversary of these important landmarks in forestry and related research, thus appeared to be an excellent time to review research developments in the light of present conditions and needs. The favorable reception of this proposal and provision of a grant of $30,000 by the Rockefeller Foundation enabled the Society to undertake the study.

The study had as its objectives reviewing the progress in forestry and related research in North America during the past quarter-century, determining the present status of research by all agencies, assessing the adequacy of present research, and formulating recommendations and goals for the next quarter-century.

The organization and direction of the study have been under a five-man Steering Committee:

Chairman, E. L. Demmon, director of the Southeastern Forest Experiment Station.

Representing the Society of American Foresters

Henry Clepper, executive secretary of the Society of American Foresters.

Hardy Shirley, dean, College of Forestry, State University of New York.

Representing the National Research Council

C. F. Korstian, dean, Duke School of Forestry.

H. B. McKean, director of research, Potlatch Forests, Inc.

The U. S. study was made and the report prepared by the director and project forester of the Forestry Research Project with the assistance of a number of collaborators and the cooperation of numerous foresters and others in public and private employment. Their cooperation in providing information and discussing with Research Project personnel progress and problems of research is gratefully acknowledged. Without this cooperation on the part of everyone contacted personally and by letter or requested to supply information by questionnaire, the study would have been far less complete.

The Canadian report was prepared by Dr. S. T. Dana, dean emeritus of the University of Michigan, and a committee of the Canadian Institute of Forestry under the chairmanship of Dean J. W. B. Sisam, Faculty of Forestry, University of Toronto.

The Mexican study was made by Dr. Enrique Beltran, Honorary Member of the Society of American Foresters, and director, Instituto Mexicano de Recursos Naturales Renovables, A. C., of Mexico. The Mexican report was translated into English by Dr. Tom Gill, executive director, Charles Lathrop Pack Forestry Foundation, Washington, D. C.

The Society of American Foresters owes those responsible for the Canadian and Mexican reports a special vote of thanks.

The U. S. Report

The United States part of the report makes up about 350 of this 450-page summary of forestry and related research in North America. It consists of recommendations and goals for the next quarter-century; section on the scope of the study, research in our national economy, the importance of the forests and related resources, and the history or development of research; a summary of the total research program; and a long section consisting of reports on 15 subject matter fields.

The following material from various sections of the United States report is presented not as a summary but as an attempt to indicate some of the information contained.

Expenditures Increased

Table 1 shows the approximate increases in expenditures for research in about the past 25 years or the period covered by this report. When allowance is made for the decreased purchasing power of the dollar, or, after reducing expenditures to common terms by applying the Wholesale Price Index of the Bureau of Labor Statistics, total 1953 research expenditures are ten times those for 1926.

It is evident from the information of Table 1 that the increases vary greatly between fields or research areas. The increases range from fourfold for the sciences basic to forestry and forest pathology to eleven, fourteen, and more than one hundredfold for forest wildlife research. It should be emphasized that some of these increases, such as those for forest wildlife research, are large because research in these areas was practically nonexistent in 1926.

Expenditures by Agencies

The information of Table 2 indicates the contributions to the total United States research effort being made by the four agency groups: Federal, Accredited Forestry Schools, Other Public and School, and Industry and Private. The U. S. Forest Service is the principal federal agency in the first category but many others are making important contributions to certain research fields. Although the accredited forestry schools were carried as a separate entity throughout the study, they may be lumped with the other public and school agencies to obtain the total contribution to research by state-level and school research groups. The industry and private group includes a num-

TABLE 1.—INCREASES IN EXPENDITURES FOR FORESTRY RESEARCH BY MAJOR RESEARCH GROUPS

Major fields	Expenditures		
	1926	1937	1953
Timber production			
Sciences	$ 200,000	$ 370,000	$ 1,500,000
Management	420,000	2,070,000	5,800,000
Protection			
Fire	50,000	210,000	420,000
Entomology	90,000	180,000	1,050,000
Pathology	140,000	270,000	1,030,000
Total timber production			
Forest products and utilization	$1,600,000	$3,200,000	$31,000,000
Forestry-related management			
Wildlife	$ 10,000	$ 80,000	$ 2,500,000
Range	50,000	340,000	1,200,000
Influences	40,000	330,000	600,000
Recreation	—	22,000	330,000
Total	$2,600,000	$7,072,000	$45,400,000

TABLE 2.—EXPENDITURES FOR FORESTRY RESEARCH IN 1953 BY AGENCY GROUPS AND SUBJECT MATTER DIVISIONS

Major fields of forestry research	Federal	Accredited forestry schools	Other public and school	Industry and private	All agencies
	Percent				
Timber production					
Sciences	6	1	7	2	16
Management	33	5	8	13	59
Protection	17	1	6	1	25
Total	56	7	21	16	100
Forest products and utilization	9	2	4	85	100
Forestry-related management					
Wildlife	6	7	86	1	100
Range	64	12	23	1	100
Influences	87	1	11	1	100
Recreation	4	26	65	5	100
Total	21	4	13	62	100

TABLE 3.—EXPENDITURES FOR FOREST PROTECTION RESEARCH BY AGENCIES IN 1953

Agency group	Expenditures			
	Fire	Entomology	Pathology	Total
Public				
Federal	$250,000	$ 780,000	$ 670,000	$1,700,000
Accredited forestry schools	10,000	28,000	47,000	85,000
Other public and school	80,000	223,000	297,000	600,000
Industry and private	80,000	19,000	16,000	115,000
Total	$420,000	$1,050,000	$1,030,000	$2,500,000

TABLE 4.—THE INCREASE IN EXPENDITURES FOR FOREST PRODUCTS AND UTILIZATION RESEARCH FROM 1926 TO 1953

Year	By industries	By public agencies	Approximate total	Approximate portion of product value (Percent)
1926	$ 900,000	$ 700,000	$ 1,600,000	.04
1937	2,500,000	800,000	3,300,000	.07
1953	26,550,000	4,450,000	31,000,000	.24

TABLE 5.—APPROXIMATE TOTAL EXPENDITURE FOR FOREST PRODUCTS RESEARCH IN 1953 BY ALL AGENCIES OR GROUPS

Product field	Company laboratories	Association and private laboratories	Public agency laboratories	Total expenditures	Percent of total
Pulp, paper and other fiber products	$14,500,000	$2,000,000	$1,500,000	$18,000,000	58
Lumber and lumber products, etc.	3,500,000	1,500,000	2,000,000	7,000,000	23
Wood preservation	1,200,000	150,000	250,000	1,600,000	5
Plywood and veneer	1,300,000	300,000	300,000	1,900,000	6
Miscellaneous	1,800,000	300,000	400,000	2,500,000	8
Totals	$22,300,000	$4,250,000	$4,450,000	$31,000,000	100

TABLE 6.—APPROXIMATE INDUSTRY EXPENDITURES FOR FOREST PRODUCTS RESEARCH IN 1953 AS RELATED TO VALUE OF PRODUCTS SHIPPED IN 1952

Product field	Approximate value of products shipped in 1952	Industry expenditure for research Company + association and private — 1953 Percent of product value
Pulp, paper and other fiber products	$ 5,500,000,000	$16,500,000	0.30
Lumber and lumber products, etc.	6,000,000,000	5,000,000	0.08
Wood preservation	330,000,000	1,350,000	0.41
Plywood and veneer	570,000,000	1,600,000	0.28
Miscellaneous	600,000,000	2,100,000	0.35
Totals	$13,000,000,000	$26,550,000	0.20

TABLE 7.—APPROXIMATE EXPENDITURES FOR FORESTRY-RELATED RESEARCH BY AGENCY GROUP IN 1953

Research field	Approximate expenditures Federal	Forestry schools (accredited)	Other public and school	Industry and private	Total
Wildlife	$ 150,000	$180,000	$2,150,000	$20,000	$2,500,000
Range	770,000	144,000	275,000	11,000	1,200,000
Influences	520,000	7,000	69,000	4,000	600,000
Recreation	10,000	79,000	196,000	15,000	300,000
Total	$1,450,000	$410,000	$2,690,000	$50,000	$4,600,000

TABLE 8.—THE TRAINING OF 1928 TO 1953 ACCREDITED FORESTRY SCHOOL GRADUATES IN FORESTRY AND RELATED RESEARCH

Item	Percentage of graduates by highest degree held Bachelor's	Master's	Doctor's
	By employing agency		
Forestry schools	5	54	41
Other public and school	31	49	20
Federal	34	53	13
Industry and private	60	31	9
	By research field		
Protection	26	41	33
Sciences and management	27	52	21
Range	29	54	17
Influences	31	49	20
Recreation	31	63	6
Wildlife	41	47	12
Utilization of products	44	41	15

TABLE 9.—EXPENDITURES FOR BASIC VS. APPLIED WOOD PRESERVATION RESEARCH IN 1953

Research group	Applied Amount	Percent	Basic Amount	Percent	Total Amount	Percent
Industry	$1,316,000	94	$ 84,000	6	$1,400,000	88
Public	160,000	80	40,000	20	200,000	12
Total	$1,476,000	92	$124,000	8	$1,600,000	100

ber of private and association laboratories but the expenditures are predominantly by large industry research laboratories, particularly those in the pulp and paper industry.

Although certain groups of agencies make the largest research expenditures and consequently the majority of the research contributions in certain fields, no group is dominant in all fields.

Expenditures in Subject Matter Fields

In the subject matter sections, which make up about two-thirds of the total report, research expenditures are broken down by smaller subdivisions, to the maximum extent permitted by the information gathered. The majority of these subject matter reports are prepared in a form permitting reproduction apart from the report as a whole.

Table 3 is an example of a further breakdown in one of the subject matter fields, protection. The expenditure of $420,000 for fire research compares to an expenditure of more than $70,000,000 for fire protection made at present by public and private groups and an estimated annual forest fire loss of about $100,000,000.

The expenditure of somewhat more than $2,000,000 for entomology and pathology research is a small investment when compared to the losses caused by insects and diseases, reported at present to exceed those by fire.

The information of Table 4 indicates to what extent the expenditures for forest products or utilization research have grown since 1926. We are now investing in research six times as much of total products value as in 1926.

Table 5 indicates the extent to which it was possible to break down the information gathered in certain subject matter fields. This information on forest products research shows the dominance of pulp and paper investigative effort. Research by pulp and paper companies makes up 58 percent of the total industry products or utilization research contribution.

The information of Table 6 is a further breakdown of material gathered on forest products and utilization research. Even in the wood preservation and pulp and paper fields, industry research expenditures, when expressed as percentages of products' values, are far from the 1.0 percent of products' value considered to be the minimum that forward-looking and progressive industries must spend at present to maintain their competitive position and insure their future.

Research expenditures, considered in

this report as forestry related fields, are shown in Table 7. The dominance of public agency research in these fields is evident. The past 25 years have seen major increases in wildlife and range research. Included in this important group of subject matter fields are examples of probably the best financed and the most inadequately financed research efforts covered in this study.

Research Personnel

Although financing of research is important, the quality and training of the research personnel may determine progress and developments to a major extent. Considerable study was given the quality and training of research personnel in forestry and related research. There are serious shortages of qualified and well trained research personnel in practically all research fields.

It is generally recognized that graduate study increases the productiveness and competence of individuals possessing other qualifications for research. In many fields, such as physics and chemistry, training to at least the master's level is about the minimum training requirement for research. That this is not the case in forestry and related research is indicated by the information of Table 8.

Of the total of 1429 accredited forestry school graduates reported by these schools as presently engaged in research, 34 percent hold only the bachelor's as their highest degree, 47 percent hold the master's as their highest degree, and 19 percent have earned the doctorate. It is apparent from the information of Table 8 that there is considerable variation between employment groups and research fields with respect to emphasis placed on graduate training.

Research workers at all levels of training are needed in a balanced research program. However, the present situation, with 34 percent of the graduates of accredited forestry schools engaged in research holding only the bachelor's degree, is not encouraging.

More Basic Research Needed

In most cases it was impossible to separate expenditures for basic research from expenditures for applied research and they were combined in all of the previous tables. However, several attempts were made to determine for specific research efforts the division of emphasis, as measured by research expenditures, between basic or fundamental and applied research.

The results of one study are shown in Table 9. In the wood preservation field, research is a considerable enterprise and is engaged in by both industry and public agencies, but with industries conducting the major part, 88 percent of the total. Public agencies engage in somewhat more basic research than do the industries, 20 percent of the public agency expenditures being for basic research as compared to 6 percent of the industry expenditures. Of the total wood preservation research expenditures, 8 percent are for basic and 92 percent for applied research.

Although there are brighter spots in the total research effort than this example, investments in basic research, which has been defined by Vannevar Bush as the type of research that provides "scientific capital," are completely inadequate to insure the background of knowledge necessary to the nourishment of applied and development research.

Summary

These excerpts from the report on forestry and related research in the United States indicate that there has been a large growth in research activities in the past twenty-five years and that expenditures in 1953 were approximately $45,000,000.

When compared to previous estimates and reports on expenditures for research, $45,000,000 sounds like an imposing amount. However, when compared to the values this research is expected to protect, and even greater values that may be developed through research, it is a small investment and completely inadequate. The total research investment, $45,000,000 is considerably less than the research investment of a single large U. S. chemical company and it is only about 1.0 percent of our total national research investment of $4 billion.

The complete report will show what appear to be the research expansion needs in each of the 15 subject matter fields; examples of past accomplishments and of important problems requiring research are given; the importance of the several research agency groups in the expansion program is discussed; the research personnel and its training is covered in considerable detail, and suggestions are made on means of reaching the research goals set for the next quarter-century.

The personnel of the Forestry Research Project, W. H. Cummings and myself, wish to express to all our thanks and appreciation for the cooperation provided in connection with the information-gathering part of the project. The survey proved to be a far larger undertaking than had been anticipated. We hope that the study and final report, which should be published within the next six months, will prove of interest and value to you and that the Forestry Research Project has accomplished its objectives.

F. H. KAUFERT
W. H. CUMMINGS
Director and Project Forester, respectively,
S.A.F. Forestry Research Project

Committee on Accrediting

During the past year, the Committee was reconstituted, with four individuals entirely new to its membership.

The Committee has discharged its normal functions with reference to the examination of two institutions for purposes of accreditation. These matters have resulted in confidential recommendations to the Council.

The most interesting activity of the Committee was the cooperation with Northwest Association of Secondary and Higher Schools in the examination of the University of Idaho. This was the first example of an evaluation of a forestry curriculum in conjunction with a regional education association. The complete Examining Committee was headed by Dean F. A. Gilfillan, School of Science, Oregon State College. As might be expected, the joint examination revealed considerable room for improvement in this type of examination. The main value of the examination was in making all members of the accrediting team aware of their mutual concern for the improvement of higher education and the interdependence of those in general education and those in professional education. The joint examination of the University of Idaho gave every evidence that this form of accreditation will increase in value with each examination.

The chairman of the Committee cooperated also with the Northwest Association in the examination of Idaho State College. This participation was at the request of President McIntosh of this institution. Three preprofessional curricula—Engineering, Agriculture, and Forestry are offered. This offering of preprofessional curricula appears to be a growing pattern in American higher education. Preforestry curricula afford the opportunity to many students to pursue the first two years of their forestry education

THE COMMITTEE ON ACCREDITING at work. *L* to *R*, Dr. Frank H. Kaufert, University of Minnesota; Dr. Ernest Wohletz, University of Idaho; Dr. Myron Krueger, University of California; Dr. E. R. Martell, Purdue University; and Dr. C. M. Kaufman, University of Florida.

closer to home. However, there is the danger of a less adequate educational foundation or the threat of another four-year forestry curriculum, or both. No conclusions can be drawn from the preforestry curriculum in this one institution but preforestry curricula are a factor of higher education to which the Society must pay attention.

Due to the rapid progress in the profession of forestry, the Committee gave prolonged attention in its meeting of October 25, to possible changes in accrediting standards. The Committee ended it deliberations in a state of almost complete confusion. This augurs well for the effectiveness of the work of the Committee during the coming year. In its efforts to relieve its own confusion, the Committee is bound to produce something of value for the Society and professional education.

MYRON KRUEGER
Chairman

Committee on International Relations

By far the most important international forestry event scheduled for the present year is the Fourth World Forestry Congress to be held in Dehra Dun, India, December 11-22, 1954. Preparations for this Congress have occupied a good part of the work of the Committee on International Relations. Dr. V. L. Harper, a member, is vice chairman of a special committee charged with United States participation in the Congress, and your chairman is secretary.

Early in the year two articles were prepared outlining the plans and arrangements for the Congress, and these were published in the JOURNAL. In addition, memoranda were prepared and distributed concerning travel information and visa and health regulations, and detailed information was supplied to a number of Society members by correspondence. As of this date, it appears that at least ten Society members will be attending. Each Society member attending the Congress will go as a delegate of the Society itself.

The technical papers being prepared for this Congress should constitute an important addition to forestry literature; many of them probably will be of interest to Society members. For that reason, it is hoped that a list of papers can be published in the JOURNAL, and a mimeographed set of the papers themselves placed on file at the Society office and available for loan to interested members.

It is likely that the forestry world will be looking to the United States to play host to the next Congress, which will probably be held in 1959 or 1960. The decision on this need not be reached for three years or so, but should the United States accept this responsibility, it will require a major effort on the part of the Society, the Forest Service, and the forest industries.

Since the last report of this Committee, the Eighth Pacific Congress was held in Quezon City, Philippines, and was attended by several members of the Society. At the Eighth International Congress of Botany held in Paris, France, July 2-14, the Society was represented by two delegates, Lee M. Hutchins and J. S. Boyce. At the meeting of the International Union for the Protection of Nature, held in Copenhagen, August 25-September 3, no official delegates were present from the Society.

Future international meetings of possible interest to our membership are as follows: A training conference on land problems in Asia, to be held in Bangkok, Thailand, in late November and early December 1954; meetings of FAO's regional Forestry Commissions for Asia and the Pacific (Tokyo, April 1955), Latin America (Venezuela, probably, May or June 1955), Near East (early 1955), and Europe (Rome, October, 1955); and the biennial meeting of FAO's Conference, in Rome, November 1955. The 12th Congress of the International Union of Forest Research Organizations will be held in the United Kingdom in 1956.

During the past year your Committee has given much consideration to the grade of Corresponding Member. In that time the Committee approved three applications for membership in that grade, and the total number of Corresponding Members now stands at 64, an almost insignificant number in relation to the total of Members and Junior Members. Corresponding Membership, you may remember, is open to "noncitizens who have shown substantial interest in American forestry" whose applications are endorsed by the Committee on International Relations, supported by statements of endorsement by three voting members of the Society. Corresponding Members pay no dues. They do not receive the JOURNAL OF FORESTRY, although they may, of course, subscribe to it, just as could any nonmember. Aside from its possible prestige value, the only concrete benefit derived from this grade of membership would seem to be the privilege of ordering books at the 10 percent discount offered by the Society to its membership. Even this privilege is of doubtful benefit to foreign foresters living in countries where import restrictions or currency difficulties impose a hardship.

Your Committee therefore has been considering possible ways of making the grade of Corresponding Membership more meaningful and of giving it added attractiveness to foreign foresters. One Committeee member points out that presumably the original intention was that Corresponding Members, having shown considerable interest in American forestry, would take part in the activities and discussions by written rather than by verbal means. But with whom is such a member to correspond? And do we want a panel of correspondents in the United States in order to maintain an exchange of thought and ideas with opposite numbers in other countries? If

this was the original idea in creating that grade of membership, it might be advantageous to add a section of foreign news notes in the JOURNAL. Along this same line, another member of the committee writes, "I have long felt that foreign foresters would be more interested in Corresponding Membership in the Society if somehow they could be induced to contribute more articles or notes for the JOURNAL. I realize that may sound almost contradictory, but one or two Filipino foresters have discussed this matter with me, and agree that if greater participation could be achieved, greater general interest would result. Formal articles of merit cannot be expected in quantity, but informal notes along the lines of the 'news notes' for the International Society of Tropical Foresters would be helpful. As you know, the British *Empire Forestry Review* carries a section devoted to a digest of foreign correspondence. It is quite popular."

It seems difficult to your Committee to make definite recommendations in regard to this grade of membership without adding to the expenses of the Society or the responsibilities of the already overworked Washington office. It is therefore making no recommendations to the Council at this time, but would welcome suggestions both from foreign and American foresters.

The Committee has continued to supply letters of introduction and itinerary suggestions for American foresters going abroad, as well as foreign foresters coming to the United States. It has also taken advantage of every opportunity to assist in placing well qualified foresters in the foreign resource-aid projects of government, as well as to urge the recognition of forestry's indispensable role in all resource development projects. At least a few key individuals concerned with these programs are becoming aware of the need for a definite forestry policy to be related to these programs. The Committee will continue its efforts along this line.

Early in the summer of the past year the chairman cooperated with the Steering Committee for the Society's Forestry Research Project by holding several conferences with Prof. Enrique Beltran regarding the Mexican section of the report on forestry research. The chairman later translated the report into English for the use of the Steering Committee.

During recent months there has been a change in the structure of the National Conference of Nongovernmental Organizations on FAO, of which the Society has been a member since the outset. This Conference was set up to advise the US-FAO Interagency Committee on matters of USA policy toward FAO. Over the past several years this Conference has become an agglomerate of organizations, many of them without real concern for FAO objectives. During the past summer the list of these member organizations has been reviewed, and a number dropped in order to obtain a more effective functioning of the Conference. The Society was retained among the organizations making up the new Conference, and its representatives are the chairman of the Committee on International Relations, and your executive secretary. The Society is also represented by the same two members on the Executive Committee for the National Conference of Nongovernmental Organizations on FAO.

Among accessions from foreign forestry literature during the year are issues of several foreign language forestry periodicals and an *abstract of papers* presented at the Eighth Pacific Science Congress.

PAUL W. BEDARD
I. T. HAIG
V. L. HARPER
LEROY HUNTINGTON
BARRINGTON MOORE
LYALL E. PETERSON
J. W. B. SISAM
TOM GILL, *Chairman*

Council Committee on Membership

The changes in the Constitution regarding membership requirements and procedure which were approved by the Society membership in February, 1953, have been in operation for more than a year and a half. The changes have made the processing of membership applications much easier for both the Executive Secretary's office and the Council Committee on Membership.

The Committee's chief problem is that of advancement of Affiliate Members to the Junior Member grade. Affilate Members fall in three categories: (1) graduates of unaccredited schools, (2) graduates of nonforestry curricula in accredited schools, and (3) persons who have had at least six years of practical training or a combination of practical and theoretical training equaling at least six years.

Since Affiliate Members have deficiencies in their technical training, they can advance to the Junior Member grade only after making up these deficiencies. The Council Committee on Membership must decide, on the basis of evidence presented by the applicant and his sponsors, whether these deficiencies have been overcome. The crux of the matter as provided for in Bylaw 6B is that "satisfactory evidence is submitted that during their total experience they have gained a knowledge of all the professional courses included as a minimum in an approved curriculum in an accredited forestry school." Our committee needs complete specific information on the applicant's experience if it is to evaluate his qualifications. The applicant himself and his sponsors can help to expedite the applications by giving adequate information. This matter was called to the attention of Section officers and chairmen of Section membership committees in August. We solicit the assistance of all members in this matter.

Most of the Affiliate Members who come into the Society on the basis of practical training and limited theoretical training cannot qualify for Junior Membership. Unless they occupy a position that gives them varied experience, their experience will not be sufficiently diversified or of a sufficiently technical character to qualify them for Junior Membership.

Since it takes considerable time and effort to become thoroughly familiar with membership requirements, it seems desirable to have some continuity in the personnel of Section membership committees.

We set a goal of a net increase of 1000 members for 1954. We fell far short of this goal. For the first 10 months of the year, the net increase in members was 646. For the full year, new and reinstated members probably will be approximately 1000. Obviously, we lose too many members each year.

Attention should be called to the fact that three sections — Inland Empire, Northern Rocky Mountain, and Upper Mississippi Valley — met their quotas, and the Ozark and Southeastern sections fell just short. Although we fell short of our goal of a net increase of 1000 members, we believe the effort has made all of us more conscious of the membership problem, and has resulted in a larger increase in membership than would have occurred without the goal.

Membership terminations are too large in number. The Society could be greatly strengthened by retaining more old members. This should be a challenge to each of us. At a joint meeting

of the Council and Section delegates on October 24, this problem was discussed, and some good suggestions were made for coping with it. It was suggested that Section activities should be made so interesting and worthwhile that members will feel that they can ill afford not to be members. Employers should encourage their employees, especially the younger members who may not fully appreciate the value of the Society to them, to attend Section meetings, and when feasible, they should provide transportation for these men. This plan is already operating in some areas. Keeping members in the Society is primarily a Section responsibility. Each of us has a responsibility in this matter.

At yesterday's meeting of the Council, means of increasing membership during 1955 were discussed. The 2000 former members who dropped out of the Society during the past five years present a real challenge. In the belief that payment of a year's back dues plus current dues for members who dropped out prior to 1950 may keep substantial numbers of former members from applying for reinstatement, the Council amended Bylaw 21 to provide that in no case shall the payment of back dues exceed six month's dues. Furthermore, as an aid to increasing membership during 1955 the Council voted to remit for *one year*, dues-in-arrears payments for those applying for reinstatement. We urge all of you to contact former members in an effort to stimulate the number of reinstatements.

C. H. COULTER
E. F. HEACOX
R. H. WESTVELD, *Chairman*

Committee on Safety

The Committee has been active this past year in drafting a safety leaflet entitled, "Steps in Organizing a Woods Accident Prevention Program." We hope to complete this project in 1954, so that it will be available for general distribution next year. We also conducted a survey of accident prevention activities in forestry schools. This has been summarized and copies are being sent to all schools. (Reproduced below.)

We have had three requests for information this year, from Yale, Texas, and Ontario. It is hoped we will get increasing inquiries—from forest industry, schools, local and state government forestry agencies, as we continue to put into effect the Society's Four-Point Policy on Safety. We again offer our services to anybody desiring our counsel on specific safety problems.

The Committee plans to produce data sheets on accident prevention materials and training aids for forest schools and on methods of safety instruction in the near future. This is the result of this year's questionnaire.

We will close our report with some encouraging news from the National Safety Council. During the past 5 years, forest industries have made substantial progress in accident prevention, as this table shows:

Industry	Year	Injury frequency rates per million man hrs.	Injury severity rates per thousand man hours
Lumber	1949	47.72	4.67
	1953	33.71	3.90
Woods products	1949	23.25	1.32
	1953	17.55	1.09
Pulp & paper	1949	11.62	1.03
	1953	9.54	0.89
All industries	1949	10.14	1.02
	1953	7.44	0.83

Forest industry rates, particularly lumber, are still too high. Your Committee offers its services to assist in every way possible to keep more people productively at work in the woods.

E. T. CLARK
OVID L. HOLMES
HARRY H. JEFFERSON
J. KENNETH PEARCE
SETH JACKSON, *Chairman*

Summary of Survey of Safety Instruction in Forestry Schools September 1954

Graduates who engage in forestry work in federal, state, or private organizations are surrounded by greater and more numerous natural and other hazards than in the average occupation or profession. For example, for 1951 to 1953 inclusive, the National Safety Council reports that logging industries had 57 injuries per million man hours worked, compared with an all-industry rate of 8. During the same period, loggers lost 8 days per thousand man hours worked; all industry lost less than 1.

Thus, it becomes readily apparent that we can contribute greatly to better forestry by reducing accidents in the woods. One of the most effective ways to do this is to indoctrinate our student foresters in safety and accident prevention techniques. The Society's Policy on Safety says in part, "The Council recommends that schools of forestry indoctrinate students in the principles of safety."

A questionnaire on safety instruction was sent to 45 forestry schools in the United States on July 6. The Society of American Foresters' Committee on safety has tabulated the results of the 37 replies below.

Question 1: How is instruction in accident prevention organized at your school?

Eight schools have safety policy statements. Safety committees are active at six locations. Two have a safety officer heading up safety. Three others cover it only during summer camps. At thirteen schools, instructors handle safety in connection with their courses. Only two reported no safety organization. Only Syracuse submitted a copy of a policy statement. This is excellent, and could well serve as a model for other schools interested in preparing one.

COMMITTEE COMMENTS AND RECOMMENDATIONS

We are glad to note that several approaches are being used in organizing safety in forestry schools. Except as noted below, we see no need for standardizing because each school has its individual problems which can best be worked out locally. We recommend, wherever they have not done so, that the forestry school heads review the problem and issue a clearcut policy statement to their staffs on what to do and how to do it. Top management support is essential in any safety effort. The details of putting the policy into effect can be worked out in many ways. The Committee wishes to stress the importance of each school appointing a safety committee or the designation of a faculty member as safety director.

Question 2: Is a credit course given in accident prevention? If so, how many hours?

Thirty-three schools do not give the credit courses. Two schools report five elective courses available in other departments. One school, the University of Washington, is conducting a course in safety practices in forest industries for which two hours' credit is given. This is handled largely on a seminar basis with guest lecturers from private industry, state, and federal agencies. Montana State University has assigned

a faculty member to give a special course in safety.

COMMITTEE COMMENTS AND RECOMMENDATIONS

Integration of woods accident prevention techniques in existing courses is the preferred method of imparting safety instruction in forestry schools. Probably elective courses are available in engineering colleges at several schools other than the two mentioned above. It is recommended that students interested in safety be urged to take these as electives in addition to the above, to give them a broader background in safety.

Question 3: Is accident prevention integrated with other courses? If so, how many hours, or what percent of course?

It is integrated in all schools but two, with an average of roughly four hours, or about 3 percent of the course. Averages are difficult to tabulate here, because the spreads are from 1/10 hour to 20 hours, ½ credit to 2 credits, from 1 to 10 percent.

COMMITTEE COMMENTS AND RECOMMENDATIONS

We have enough background as a Committee now so that we can furnish advice on either how to integrate safety in curricula or how to organize a complete safety course. Integration is the favored method.

Question 4: Is accident prevention thoroughly covered in all field work, including summer camps and demonstrations?

It is thoroughly covered in 27 schools, not thoroughly in 6, and not at all in 4.

COMMITTEE COMMENTS AND RECOMMENDATIONS

Student safety is capably handled in most schools, apparently. Do the others want help?

Question 5: Does your school take advantage of safety movies, leaflets, talks, demonstrations, and other aids to accident prevention?

Thirty-one schools use these aids, five only to a limited extent, and only one not at all.

COMMITTEE COMMENTS AND RECOMMENDATIONS

Schools are generally active here, too. We will furnish them with additional material sources.

Question 9: What is the scope of your safety instruction?

Currently, 24 schools stress personal safety during field trips, demonstrations, and camps. Many are giving practical training in hand tool and equipment use, first aid, fire fighting. In the classroom safety is integrated in courses such as logging, lumbering, mensuration, fire protection.

COMMITTEE COMMENTS AND RECOMMENDATIONS

Safety instruction generally is in the form of protecting students from injury, rather than teaching safety principles which will help them develop safety programs later. A lot of fine instruction is being given, however. Some of the replies were so good that we will give this subject further consideration, with the thought of producing a data sheet on methods of safety instruction.

Question 7: Is there any way the Committee on Safety can help you with your safety program?

Twenty-two schools requested help; only 4 said no help was needed. The remaining 11 schools did not answer this question. Our help was solicited for sources of safety materials and training aids for instructors, summaries of woods work injuries, including some case histories, what other schools are doing. Specific requests were for more woods safety movies like *Do It With E's*, publish a good booklet like Hooker's *Woods Safety Handbook*, and status of student insurance. One school wanted Committee opinion on its safety program.

COMMITTEE COMMENTS AND RECOMMENDATIONS

We are glad to get these suggestions. We will produce a data sheet for forestry schools, listing accident prevention materials which will help them. We will not be able to handle the specific requests, but we will do all we can to promote them.

SUMMARY

We are pleased to note an increase in accident prevention activities in forestry schools since our last survey two years ago. There has been a tremendous improvement in interest, not only in accident prevention, but also in actual accomplishment to that end. We will attempt to develop some fact sheets to assist the schools this year. In the meantime, we will be glad to serve as a clearing house if information is wanted on any phase of safety. We suggest that all schools include the principles of accident prevention, using the personal safety of the students as a model of how the principles can be put into practice.

E. T. CLARK
OVID L. HOLMES
HARRY H. JEFFERSON
J. KENNETH PEARCE
SETH JACKSON, *Chairman*

Collating Committee on Grade Standardization of Forest Planting Stock

The original purpose of this committee was to develop a uniform basis of judging quality and acceptability of nursery stock for forest planting on a regional basis, by species or groups of species, similar in nursery development or field performance.

Subsequently the project, under the chairmanship of D. S. Olson, now at the University of Idaho was broadened to cover the problems of seed source certification, control of seed source, insect and disease inspection, and control of conditions under which the stock is grown in the nursery, especially as regards density of sowing and age class of stock. The chairmanship of the collating committee was passed to me at the suggestion of D. S. Olson who did not find time to complete the task of collating the information supplied by several subcommittees. At present we have reports from six subcommittees by regions as follows:

1. Northeast and middle Atlantic States.
2. Central States (Ohio, Indiana, Illinois, Iowa).
3. The South.
4. Lake States.
5. Prairie and Rocky Mountain States.
6. West Coast.

As might be expected there is considerable difference in the criteria for stock grade standards developed by various subcommittees. However, in spite of some diversity of opinion I believe the data at hand can be prepared as a useful guide, representing the pooled judgment and opinion of experts in the various regions.

To round out the project, it appears desirable to enlist the aid of three Canadian nursery and planting experts, one each from Eastern Canada, the Prairie Provinces, and from the Canadian West. They will be asked to evaluate the recommendations on stock quality standards suggested by those in the United States in areas adjoining these three broad Canadian zones, where the same tree species are used in reforestation, and to determine if they are in agreement with the proposed standards, and to solicit suggestions on modifications or changes needed to fit Canadian conditions.

Once we have these recommendations we will be in a position to hammer out an overall review draft, for joint criticism and suggestions by the various subcommittees, and then to take up

with Henry Clepper and other Society officials the matter of publication of the overall report. With good luck such a report should be ready for the next national meeting.

J. H. STOECKELER
Chairman

Progress Report on Review of Section Bylaws

Subsequent to receipt of copies of existing Section bylaws furnished by the 21 Sections, a preliminary analysis was made of their content and coverage. A wide diversity in format and considerable variation in content and coverage immediately became evident. For example, over 80 different main title or section headings are now in use. The number of such headings per set of Section bylaws varies from 7 to 15, with an average of about 11.

Analysis of all the items included in the various sets of bylaws indicates that provision for inclusion of the pertinent ones can be made under some 12 or 13 main title or section headings. Each such heading would cover a single item or two or more directly related items. A tentative list of main headings has been prepared and appropriate wording, in skeleton form, is being developed for consideration.

GEORGE R. PHILLIPS
Chairman

Statistics of the Milwaukee Meeting

The total attendance was 831 of whom 125 were ladies.

The number registered for the technical sessions totalled 706. Of these 653 were members, 15 were students, and 38 were guests. The five states with the largest attendance were Wisconsin 156, Michigan 108, Minnesota 71, Illinois 31, and Indiana 27.

In all, 44 states were represented together with the District of Columbia (24) and Alaska (2).

There were 10 from Canada and one each from Burma and Denmark.

The breakdown by fields of employment is as follows:

U.S. Forest Service	171
Other federal agencies	34
Industry	156
Education	137
State agencies	114
Extension services	11
Students	15
Guests	38
Miscellaneous	30
Total	706

IMPORTANT NOTICE TO SUBSCRIBERS

If you are going to move, it is necessary that the proper notification be made, at the earliest possible moment by letter, post card, or post office form No. 22S, giving the old address, as well as the new, with postal-zone number if any. You should also notify your local post office on postal form No. 22 of your change of address. Both postal forms are obtainable at any post office.

As considerable time is required to process a change of address, you are urged to advise the JOURNAL as soon as you know your new address, preferably four weeks in advance of moving.

JOURNAL OF FORESTRY
Mills Building, Washington 6, D. C.

OFFICERS AND MEMBERS OF THE COUNCIL. *L* to *R*, seated, J. S. Illick, President E. L. Demmon, Vice President DeWitt Nelson, Executive Secretary Henry Clepper. Standing, E. F. Heacox, Stanley G. Fontanna, C. Huxley Coulter, R. H. Westveld, P. D. Hanson, and J. Herbert Stone.

Report of Council Meeting

A meeting of the Council was held on October 24, 1954 in the Schroeder Hotel, Milwaukee, Wis.

Nine members, a quorum, were present: President E. L. Demmon, Vice President DeWitt Nelson, C. H. Coulter, S. G. Fontanna, P. D. Hanson, E. F. Heacox, J. S. Illick, J. H. Stone, R. H. Westveld; together with Henry Clepper, executive secretary. W. J. Brown and D. B. Demeritt were unavoidably absent.

Payment of Back Dues

On motion by Mr. Stone, seconded by Dr. Westveld, Bylaw 21 (paragraph 3) was amended by unanimous approval, as follows (amendment in italics):

> In the case of a member whose dues remain unpaid on November 1, the Executive Secretary shall notify both the member himself and the Secretary of his Section, that the dues must be paid or a request for remission or postponement made within thirty days. For newly elected members the provisions of Bylaw 37 shall apply. If the dues are not paid, nor a request for remission or postponement made by the member or his Section within thirty days after such notice from the Executive Secretary, membership shall automatically terminate, unless charges of unprofessional conduct are pending in which case membership shall not terminate until the charges have been disposed of. A member thus dropped for nonpayment of dues shall not be eligible for reinstatement to any grade of membership until he shall have paid the dues in arrears at the time he was dropped. *In no case shall this payment exceeds six months' back dues.*

The reason for this amendment is as follows: A likely source of membership prospects is from former Society members. Recently about 2,000 cards listing the names and addresses of former members for the past five years were sent to the Sections.

To be eligible for reinstatement, current Society practice requires the payment of a year's back dues from members dropped prior to 1950, together with current dues. Payment of only half-years dues and current dues is required from members dropped subsequent to 1950. (Prior to 1950 it was the practice to continue sending the JOURNAL to a member for a full year before it was discontinued. Effective 1950, the JOURNAL was stopped after the first six months.) Until this procedure a former Member may be required to pay as much as $24 at the time of his application for reinstate-

ment. This, and even lower amounts, are difficult to collect. Many former members are either financially unable to make this lump payment or simply won't apply for reinstatement.

Unpaid Dues Remitted

On motion by Mr. Coulter, seconded by Dr. Westveld, the Council voted 8 to 1 to remit the payment of back dues of any former member who applies for reinstatement during the period November 1, 1954-December 31, 1955.

Thus a member whose membership was terminated for arrears in dues may apply for reinstatement without the payment of any arrears, provided he makes such application before the end of 1955.

This action was taken to stimulate reinstatements of membership.

Scientific Name of Douglas-fir

In the October 1954 issue of the JOURNAL (pages 803-804) was published a protest from the Columbia River and Puget Sound Sections against the change in the scientific name of Douglas-fir from *Pseudotsuga taxifolia* to *P. menziesii*.

On motion by Mr. Nelson, seconded by Mr. Stone, by unanimous vote the Council adopted the following resolution. This resolution brings to the attention of the appropriate bodies dealing with international botanical nomenclature the Society's belief that long established names of important trees be retained. Specifically, it requests that the name *P. taxifolia* be restored.

Whereas the Society of American Foresters is the recipient of much complaint, both within and without its membership, that the announced first aim (Article 4) of the International Code of Botanical Nomenclature —"fixity of names"—seems often to be disregarded in the case of important economic plants, and:

Whereas professional foresters particularly deplore the recent replacement of *Pseudotsuga taxifolia* (Poir.) Britton by *P. Menziesii* (Mirb.) Franco for Douglas-fir, the most important timber tree of the United States,

Be It Resolved that this Society commends the action taken by the Nomenclature Section of the Eighth International Botanical Congress at Paris (June-July, 1954) in formally recognizing the need of greater stabilization of nomenclature, especially as regards the replacement of scientific names of important economic plants by obscure, long-overlooked names, and by the appointment of the Special Committee on Stabilization to consider solutions for action at the Ninth International Botanical Congress at Montreal in 1956, and

Be it Further Resolved that this Society urges that, among its proposals, the Special Committee on Stabilization consider carefully the advisability:

1. Of reappointment of a special committee, such as was authorized at the Amsterdam Congress, to prepare a standard list of important economic plants which could be adopted by foresters, horticulturists, agronomists, and other practical plantsmen and remain in effect for a period of at least ten years.

2. Of interdicting changes under the priority rule due to obscure bibliographic sources undetected, say, for 100 years past.

3. Of further assistance to name stabilization by adoption of the proposed Article 78 bis (*nomina specifia reficienda*), and

Be It Further Resolved that copies of this resolution be forwarded for their information to the following persons:

Dr. Reed C. Rollins, Professor of Systematic Botany, Gray Herbarium, 22 Divinity Ave., Harvard University, Cambridge 38, Mass. (Dr. Rollins is Vice Chairman and American representative of the Special Committee on Nomenclatural Stabilization.)

Dr. J. Lanjouw, Rapporteur General, The International Bureau for Plant Taxonomy and Nomenclature, 106 Lange Nieuwstraat, Utrecht, Netherlands.

Prof. Jacques Rousseau, Director, Montreal Botanical Garden, 4101 Sherbrooke Street East, Montreal, Quebec, Canada. (President-elect, Ninth International Botanical Congress.)

Dr. John S. L. Gilmour, Department of Botany, Cambridge University, Cambridge, England. (Dr. Gilmour is Chairman of the special committee mentioned.)

Louisiana Polytechnic Institute Accredited

Dr. Myron Krueger, chairman of the Committee on Accrediting, informed the Council that the committee, after examination of the grading sheets and the report of a special visiting committee, had voted to recommend accreditation of the forestry curriculum at Louisiana Polytechnic Institute, Ruston.

On motion by Mr. Nelson, seconded by Mr. Coulter, the Council unanimously approved the report of the Committee on Accrediting.

All forestry graduates of Louisiana Polytechnic Institute are now eligible for Junior Membership in the Society immediately upon graduation. This ruling is retroactive.

University of Idaho

Dr. Myron Krueger, chairman of the Committee on Accrediting, reported to the Council on the University of Idaho, Moscow, whose College of Forestry was the first to be examined under the Society's new cooperative procedure. Under this procedure, the Society made an evaluation of the forestry curriculum cooperatively with the Northwest Association of Secondary and Higher Schools.

As a result of this examination, the Committee on Accrediting recommended that the University be continued on the Society's list of accredited institutions. On motion by Mr. Heacox, seconded by Mr. Coulter, the Council unanimously approved the continued accredited status of the University.

For further information on this matter, the reader is invited to refer to the Report of the Committee on Accrediting, published elsewhere in this issue.

1957 Annual Meeting

Under the Society's long-established system of rotating annual meetings by regions, the meeting in 1957 would be held in the northeastern states. Invitations to hold this meeting in the Allegheny, New England, and New York Sections were received from the respective Section officers.

On motion by Mr. Nelson, seconded by Mr. Stone, the Council voted unanimously to accept the invitation of the New York Section to hold the meeting in Syracuse in October 1957.

The 1955 meeting will be held in Portland, Ore., October 16-19; headquarters, the Multnomah Hotel.

The 1956 meeting will be held in Memphis, Tenn., October 14-17; headquarters, the Peabody Hotel.

Directory of Members

At the midyear meeting of the Council, held in Ann Arbor, Mich., June 13-15, the Council authorized an addition to the 1955 budget to finance the cost of publishing a new directory of members, the latest one having been issued in 1950. The estimated cost is $4,000.

In view of still rising printing costs, the executive secretary was instructed to submit a new estimate at the midyear Council meeting in 1955. Final decision on its publication will be postponed until that time.

On motion of Mr. Heacox, seconded by Dr. Illick, the Council voted unanimously to make a charge of $1 per copy for the directory.

Violation of Code of Ethics

Dated April 8, 1954, six members of the Society filed written charges of unprofessional conduct against Ralph F. Wilcox, state forester of Indiana, and Henry A. Beadell, assistant state forester. The charges alleged violation of the Code of Ethics of the forestry profession; specifically Canon 24 which is as follows:

"He (the professional forester) will not participate in soliciting or collecting financial contributions from subordinates or employees for political purposes."

Following an investigation by the Society's Committee on Ethics, the Council at its midyear meeting in Ann Arbor, Mich., June 13-15, 1954, unanimously reached the opinion that the charges were well founded; namely, that on or about June 3, 1953 Mr. Wilcox and Mr. Beadell participated in the solicitation and collection of funds for political purposes from subordinates and employees of the Indiana Department of Conservation.

On July 9, 1954 Mr. Wilcox and Mr. Beadell were notified of the charges and in accordance with the Society's bylaws were granted a period of 60 days in which to prepare and submit a written defense. On August 25, 1954

Mr. Wilcox and Mr. Beadell jointly submitted a statement to the Council.

This statement together with the original charges were carefully reviewed by the Council at its meeting on October 24, after which the following action was taken.

On motion by Mr. Fontanna, seconded by Dr. Illick, the Council unanimously voted that Mr. Wilcox and Mr. Beadell had violated Canon 24 of the Code of Ethics.

On motion by Mr. Fontanna, seconded by Mr. Nelson, the Council unanimously instructed President Demmon to write letters of censure to Mr. Wilcox and Mr. Beadell. The following letter was accordingly sent.

> After due consideration the Council of the Society of American Foresters, at its meeting on October 24, 1954 found that the charges were established that you have violated Canon 24 of the Code of Ethics adopted in 1948 reading as follows:
>
> > He will not participate in soliciting or collecting financial contributions from subordinates or employees for political purposes.
>
> In the opinion of the Council these activities are held to be in violation of Canon 24, and constitute a type of conduct which the Society cannot condone.
>
> The Council reaffirms its belief in the Code of Ethics, and urges that professional foresters should stand firmly on the Code to foster and maintain a high level of professional conduct. The Council recognizes the difficulties presented by a political contribution system, but believes that you should use the Code to a greater degree than heretofore in resisting a system which is clearly in violation of the ethics of your professional society.

At the suggestion of Mr. Coulter, the Council recommends that all members of the Society in the Central States Section and in the Indiana Chapter take appropriate steps to effectuate a correction in this unethical situation.

Preference Key for Foresters

At the suggestion of Eric A. Bourbo, Jr., a member of the Society, the Council has received an offer from Dr. G. Frederick Kuder, Department of Psychology, Duke University, to develop a preference key for foresters. Such keys or scales are used in vocational counseling. In brief, through questionnaires the interests and preferences of any professional or occupational group may be determined. A scale or key is then developed. Thus if a person's preferences are similar to those in the profession he proposes to enter, he is more apt to find that profession a congenial one.

On motion by Mr. Coulter, seconded by Dr. Westveld, the Council unanimously voted to accept Dr. Kuder's generous offer.

Change in Dues Structure

A proposed change in the dues paid by individual members to be based on income was submitted to the Council last year by H. M. Meloney of Greenwich, Conn.

After careful consideration by the Council Committee on Membership, to whom the matter had been referred for study, the Council, on motion by Mr. Heacox, seconded by Mr. Nelson, voted unanimously against adoption of the proposal.

Miscellaneous

The Council heard reports from the following staff personnel:

Miss L. A. Warren, business manager, reported on Society finances. A resume of her comments appears in the report of the executive secretary in this issue.

Arthur B. Meyer, editor, reported on the *Forestry Handbook* and the JOURNAL OF FORESTRY. His report is published elsewhere in this issue.

Lloyd Thorpe, advertising representative, reported on advertising obtained in 1954 and prospects for 1955. An abstract of his report is published elsewhere in this issue.

Division of Education

The annual meeting of the Division of Education was held in the East Room of the Schroeder Hotel, Milwaukee, on Monday evening, October 25. Some 210 members were in attendance. Chairman Kenneth P. Davis presided.

He introduced the officers for the present year, and then introduced R. Keith Arnold, School of Forestry, University of California, who spoke on the subject "The Place of Forest Fire Control in Forestry School Curriculums."

J. S. Illick, College of Forestry, State University of New York, presented a paper entitled "They Received Forestry Honors and Awards."

A short business session was conducted at this point, at which time Dr. Hardy Shirley reported that the committee requested to initiate a study of forestry education in the United States had prepared a prospectus, that the Ford Foundation had been considered as a sponsor, and that this prospectus is now under consideration by the Foundation. Dr. Shirley reported that some faculty members from the College of Forestry, State University of New York were making a study of forestry education in other parts of the world, in conjunction with other assignments.

A slate of officers for 1955 was submitted by a nominating committee, chairmaned by George B. Hartman, as follows:

Chairman, Archie Patterson, School of Forestry, University of Georgia, Athens.

Vice Chairman, Walter F. McCulloch, School of Forestry, Oregon State College, Corvallis.

Secretary, David M. Smith, Yale University School of Forestry, New Haven 11, Conn.

Dr. Myron Krueger moved, and it was duly seconded, that the Secretary cast a unanimous ballot for the slate of officers presented by the committee.

A symposium on the subject "Masters' Degrees in Forestry Schools" was moderated by Kenneth P. Davis, and separate viewpoints were reported by Professors Myron Krueger, Clarence Korstian, and Ernest O. Wohletz; Bernard L. Orell, Weyerhaeuser Sales Company; and H. Dean Cochran, U. S. Forest Service. Richard J. Preston moved that the Division of Education urge the Council of the Society of American Foresters to undertake a study of the accreditation of graduate work in schools of forestry. The motion was seconded and passed.

J. WHITNEY FLOYD
Secretary

Division of Forest Economics and Policy

The meeting of the Division of Forest Economics and Policy was held jointly with the Division of Education on October 27. William A. Duerr, chairman of the Division of Forest Economics and Policy presided. Over 200 people were in attendance.

A business meeting of the Division of Forest Economics and Policy was called as the first order of business. Chairman Duerr reported for the Committee on Research in the Economics of Forestry. He said that a study on research needs in forest economics had been completed and submitted to *Forest Science* for publication.

The future of the Committee on Forest Taxation was then discussed. Ralph W. Marquis submitted his resignation as chairman, stating that he did not have the necessary time to give leadership to the Committee. After a short discussion of the need for continuing the Committee a resolution was presented and adopted: That the Division express its appreciation to the chairman and members of the Committee on Forest Taxation for the

work done in the past few years and that in view of no urgent need for the services of the Committee at present, the Committee be dissolved. A few members expressed the view that the Division be alert to taxation problems and to initiate action when needed.

The Division Chairman announced the appointment of a Committee on Education in the Economics of Forestry (Robert F. Kenniston, Carl H. Stoltenberg, James G. Yoho, Albert C. Worrell, chairman), charged with surveying status and accomplishments, assessing needs, making recommendations, and reporting on these matters for the guidance of the profession.

The following slate of officers for 1955 were elected unanimously:

Chairman, H. J. Vaux, Berkeley, Calif.

Vice Chairman, M. B. Dickerman, St. Paul, Minn.

Secretary, A. C. Worrell, Athens, Ga.

Executive Council, R. W. Cowlin, Portland, Ore. and W. A. Duerr, Syracuse, N. Y.

A symposium entitled Economics in the General Forestry Curriculum was presented by nine persons. Using an economic approach, the speakers first presented the demand side—what they expected of forestry graduates and second, the supply side—what the forestry schools are giving the general forester in economics training. The speakers on the program and the subjects they presented follow:

The demand:

What training in economics and business do employers want in the general forestry graduate. Lawrence J. Kugelman, International Paper Company, New York, N. Y.

The public employer's viewpoint: What training in economics and business should the general forestry graduate have. Russell N. Cunningham, Lake States Forest Experiment Station, St. Paul, Minn.

The supply: What training in economics and business are the schools giving the general forester. Albert C. Worrell, University of Georgia, Athens, Ga.

Some ideas for better meeting the demand:

Through general courses in economics and business. Paul G. Keat, State University of New York, College of Forestry, Syracuse, N. Y.

Through courses in the economics of forestry. Ernest Wohletz, University of Idaho, Moscow, Ida.

Through the teaching of economics and business in other courses. Allyn M. Herrick, Purdue University, Lafayette, Ind.

Comments:

On the supply: Charles H. Stoddard, Independent Timber Farmers of America, Minneapolis, Minn.

On the proposals: Otis F. Hall, University of Minnesota, St. Paul, Minn.

By way of summary: J. Willcox Brown, University of Michigan, Ann Arbor, Mich.

The meeting adjourned at noon.

M. B. DICKERMAN
Secretary

Division of Forest Management

The business meeting was held October 27, 1954.

The following officers were elected:

Chairman, Myron B. Savage, Rayonier, Inc., P.O. Box 539, Hoquiam, Wash.

Vice Chairman, J. Walter Myers, Jr., Forest Farmers Assn., Box 7171, Station C, Atlanta, Ga.

Secretary, Lawrence K. Mays, U. S. Forest Service, Box 413, Portland 8, Ore.

DeWitt Nelson reported that the Council had returned the fire resolution of September 15, 1953 to this division for clarification of requested action. He also commented on the fact that fire had received appropriate attention at the 1953 and 1954 meetings.

Whitney Floyd moved that the Division of Forest Management request the Council to enlarge the scope of the "Joint Committee on Fire Control Equipment with ASME" to include Society study of research and development in fire control. The motion seconded by A. A. Brown was carried.

KEITH ARNOLD
Secretary

Division of Forest Products

Chairman Robt. C. Fraunberger presided at the meeting of the Forest Products Division (9 a.m. to noon on Tuesday, October 26, 1954). Due to the large attendance of over 200 foresters, the meeting had to be moved from the Pere Marquette Room to the larger Crystal Ball Room of the Hotel Schroeder. All other officers of the Division were in attendance.

Theme of the meeting was "Recent Developments in Forest Products in the North Central States." Individuals who presented papers at the meeting included W. H. Hildebrand, Mead Paper Corporation, Chillicothe, Ohio; Leland W. Hooker, Forest Products Research Laboratory, Michigan College of Mining and Technology, Houghton, Mich.; C. A. Samuelson, William Bonifas Lumber Company, Marquette, Mich.; H. O. Fleischer, Forest Products Laboratory, Madison, Wisc.; Stephen B. Preston, School of Natural Resources, University of Michigan, Ann Arbor.

Discussion leaders following each paper were Ralph K. Day, Central States Forest Experiment Station, Columbus, Ohio; Henry Shepard, American Pulpwood Association, Wausau, Wisc.; W. A. Sylvester, Trees for Tomorrow, Merrill, Wisc.; Roy Brundage, Department of Forestry and Conservation, Purdue University, Lafayette, Ind.; Fred E. Dickinson, School of Natural Resources, University of Michigan, Ann Arbor.

Highlights: The new market for low grade hardwoods from farm woodlots for pulp, including oak, providing an opportunity for farm woodlot owners to practice better forestry was covered in one paper. The impetus given to tree planting by the development of better tree planting machines, capable of planting rougher land, was covered by another paper.

Emphasis on growing high grade trees for veneer use was stressed in another excellent paper with a call for forestry schools and forest managers to consider the growing of trees for veneer. Another paper pointed out the growing mechanization of furniture plants and subsequent changes in the type of raw materials required.

A short business meeting was called by Chairman Fraunberger. During this business meeting Fred E. Dickinson, chairman of the nominating committee, proposed a slate of officers for the Divison of Forest Products for the coming year. They were elected as follows:

Chairman, Lincoln A. Mueller, U. S. Forest Service, Ft. Collins, Colo.

Vice Chairman, Russell Stadelman, Nickey Brothers, Inc., Memphis, Tenn.

Secretary, Stephen B. Preston, School of Natural Resources, University of Michigan, Ann Arbor.

RUSSELL STADELMAN
Secretary

Division of Forest Recreation

The 1954 meeting of the Division of Forest Recreation was called to order by Chairman Harthon L. Bill at 9 a.m., Tuesday, October 26. The regular increase in the attendance at the annual meetings of this division is encouraging. The comparatively large number of members and guests present (about 85) is perhaps indicative of greater recognition on the part of foresters generally of the increasing significance of recreation in forestry.

The program of the meeting was designed to be of interest to all members attending the session, but was concerned to a considerable degree with development and problems in the field of forest recreation having particular application to the Midwest.

Three of the papers dealt primarily with local developments and problems. One of these presented by M. V. Buck of the Bureau of Public Roads was concerned with "The Current Status of Planning for the Mississippi River Parkway." He pointed out that recent legislation by the Congress has made possible federal assistance in interstate planning and coordination of a continuous Great River Road and its adjacent parks and parkways.

Galen W. Pike, supervisor of the Superior National Forest, described in some detail present mining developments in the wilderness area of the Quetico-Superior, but indicated that these all lie outside the roadless areas.

"Management of the Itasca State Park Forest to Meet Recreational Objectives" was the title of a paper presented by Donald P. Duncan of the University of Minnesota. It called attention to the need, particularly at Itasca, for active manipulation of the biological resources to attain maximum recreational values. Unless some sort of intervention is undertaken, the evidence indicates that the pine stands, which constitute its most valuable recreational resource, will largely disappear.

J. V. K. Wagar provided an entertaining interlude by using apt, yet humorous illustrations as examples of differences in "Quality Standards for Forest Recreation and Wildlife Production and Harvest." His illustrations might well be used not only by other teachers in the field, but also by those proponents of improved quality in recreational standards generally.

The paper presented by James P. Gilligan of Oklahoma A and M College, entitled "The Contradiction of Wilderness Preservation in a Democracy," pointed up the difficulties confronted by both the National Park Service and the Forest Service in maintaining wilderness conditions in areas under their jurisdiction.

A short business meeting held at the conclusion of the formal papers resulted in the election of the following officers for the Division for 1955.

Chairman, William N. Parke
Vice chairman, Donald P. Duncan
Secretary, James P. Gilligan

D. P. DUNCAN
Secretary

Division of Forest-Wildlife Management

The meeting was held in the South Room of the Schroeder Hotel on the afternoon of October 26. Chairman J. V. K. Wagar presided.

Interest in this phase of forest management was evident by the standing-room-only crowd, approximating 120 people.

Three formal papers were presented on the general subject of integrating wildlife management in multiple-use forestry programs.

Ralph T. King's paper was an excellent analysis of the status and prospects of attaining this objective in public land management. He listed the specific changes and additions necessary to bring wildlife management to its full status in multiple-use forestry. This paper was very ably discussed by Harold G. Wilm of the New York University College of Forestry.

Two papers covered the Wisconsin Cooperative Wildlife Program.

Dan Bulfer, supervisor of the Nicolet National Forest, described the problems of wildlife habitat management on the Nicolet Forest and how the regular forest program supplemented by an active cooperative P.R. project with the Conservation Department was benefiting wildlife habitat.

John M. Keener, game manager for the Conservation Department, explained the operation of this program on the state, county, and national forests in the northern part of the state. Accomplishments in working with forest managers in correlating forest practices to provide wildlife habitat needs, as well as direct habitat improvement practices, were outlined.

Warren W. Chase of the University of Michigan School of Natural Resources served as discussion leader for the above two papers. His comments and the contributions to the discussion by the audience further developed the idea that very satisfactory forestry wildlife programs are possible where the forester and game manager are given the opportunity to jointly engage in planning and development of forest lands for multiple use.

Paul Hickie, Fish and Wildlife Service, gave the report of the Committee to Integrate Professional Forestry, Range Management and Wildlife Management Responsibilities. He thoroughly covered the problem, accomplishments and the opportunities available on the extensive acreage of public lands in this country. (Report reproduced below.)

Ralph T. King was elected chairman for the ensuing year.

HERMAN F. OLSON
Secretary

The Integration of Professional Forestry, Range Management, and Wildlife Management Responsibilities

1. THE PROBLEM: *Integration of the management and research responsibilities of professional forest, range, and wildlife managers is essential to assure proper multiple use on public lands.*

Your committee recognizes that integration of effort among professional personnel dealing with wild lands is the rule rather than the exception. Nevertheless, there are enough examples of things not right—of unilateral study and action, of programs either in trouble or headed for it, of inadequacies or oversights in management and research—to convince us that a thorough study of the whole problem should be made. This committee report is not intended as such a study, but rather as an attempt at preliminary exploration into a field of vast areas, strongly divergent opinions, divided responsibilities, numberless unknown ecological and biological factors, and often overriding economic and social values. Truly, the subject is a difficult one to evaluate and our report can do little more than break ground on it.

2. THE INTERESTED PARTIES: *Many groups with diverse interests are greatly concerned about the management of public lands.*

Although the full extent of forest, range, and wildlife values should come within the purview of the committee, we have concerned ourselves principally with these resources on public lands for it is here that multiple-use conflicts come into sharpest focus and it is here that better integration should prove most profitable. And if we seem to overemphasize things western, it is be-

cause the most public lands are in the West.

The activities of the professional forest, range, and wildlife managers are of interest to many people, among whom we might list personnel of the following:

Governmental agencies; national, state, county, and local.

Professional societies.

Colleges accredited to give forestry, range, and wildlife degrees.

Agricultural or livestock associations.

Nature protection groups.

Tourist associations and dude ranchers.

These categories may omit groups equally eligible for inclusion, but the great scope of public interest is obvious.

It is important that these groups, which might be lumped together as the interested public, should continue their concern and increase their understanding about public land management. In the final analysis, it is through the public exercising democratic processes that laws will be passed, funds appropriated, resources use determined, and moral precepts established. Administrators, almost without exception, recognize the all important value of public support.

A rather simple but oft repeated example is that of the overabundant deer herd. Seldom is the game manager able to establish hunting regulations which will permit the removal of excess deer without arousing a bitter storm of protest. The storm eventually dies down and after some experience with the new regulations, the public accepts them matter-of-factly, but not before a great deal of time and effort has gone into publicizing the experience of other game administrators in other areas.

P. S. Lovejoy, contemplating the difficulties in Michigan with the buck law, used to say that about 25 years would be the normal time required to "educate the public." And three years ago, when the North American Wildlife Conference was held in Milwaukee, the editor of a weekly outdoor page published in a chain of newspapers, after listening to several of the papers on the program, remarked, "It is ridiculous for you to tell these things to each other. Why don't you tell them to the public where they will do some good?"

We consider a public well-informed through adequate information and education programs, a matter of the first importance and a goal not easily achieved. Better management of forests, ranges, and wildlife will be possible only with better public support and that will come only when the public is better informed about these matters.

3. INTEGRATION OF RESEARCH: *The basis of better management is better knowledge, and for the most part this must come from research.*

This is neither the time nor place to attempt a detailed analysis of research, but because it can mean different things to different people, a few comments are in order. Research, to be useful, must be treated respectfully. It must not be used as a means of delaying distasteful administrative decisions; it must not be asked to do big jobs with little money or manpower; it should not be called on as a last resort when all else has failed.

Research must be taken partly on faith, but not entirely, for in the words of Vannevar Bush,[1] "Statistically it is certain that important and highly useful discoveries will result from some fraction of the undertakings in basic science; but the results of any one particular investigation cannot be predicted with accuracy."

For our purpose we might define research as the orderly accumulation, organization, and analysis of data according to a definite, scientifically acceptable plan. We need more "quality" research.

To state the need for research is not adequate to assure it. Possibly a fertile field for further investigation would be to determine how research projects are established and how funds are apportioned between operations and research. Frequently, a research project, which by its very nature cannot guarantee useful results, will fare poorly in competition with an action program where definite expenditures appear to bring definite results. Neither is the best possible integration a substitute for adequate financial support, but it may eliminate needless repetition or improve research and thus make more efficient use of available funds.

We believe that integration or forest, range, and wildlife research is as necessary as integration in the field of management. The findings of research should be the basis for sound administration. But it is of little practical value to the administrator of a unit of land, managed on a multiple-use basis, to know that certain techniques will increase the yield of timber, or grow additional pounds of beef, without knowing at what sacrifice in yields of wildlife or watershed values, for example, the other gains are to be attained. Has the research scientist fulfilled his responsibility when he reports his findings in a single field of investigation; or, does he have a responsibility to determine, or solicit aid in determining, what effect the application for his research will have in related fields?

It would, perhaps, serve little purpose to list the many cases of single-purpose research that are going on today. Nor should it be necessary to point out that many of the conflicts that develop between special interests using public lands stem from efforts to promote one interest without concern for others. Too often these conflicts are finally settled by highly restrictive legislation developed in far off marble halls when a much more flexible and palatable solution might have been amicably reached through cooperative effort on the ground, if all the facts were known. We suggest that research, as well as administration (management) may have failed when these controversies develop because only a part of the truth was known. It seems obvious that some form of organization is as essential to integrate the planning, conduct, and reporting of research as it is in administration.

An informal organization has developed in the Central Rocky Mountain region for the purpose of coordinating research relating to beavers and their habitat. Known as the Beaver Research Council, the organization is open to participation by any individual or agency concerned in any way with beavers, the things that beavers influence, or the things that influence beavers. At present there is representation from two state game and fish departments, three universities, and three federal agencies. The Council has no authority of any kind. Primarily, it serves as a forum for discussion, a clearinghouse of ideas, and a stimulus to multiple-purpose research. If nothing else has been accomplished, the Council has broadened the thinking of its members, and brought active participation of specialists in several fields of research whose contribution will result in a set of findings much more useable to land and wildlife administrators.

It would not be surprising if the Council sometime broadened its scope to include all phases of research on

[1] Waterman, Alan T., J. Carlton Ward, Jr., and Mervin J. Kelly. Scientific research and national security. The Scientific Monthly LXXVIII (4):214-224. 1954.

forestry, range, and wildlife, or related "wild land" uses. Is it too much to hope that some day a full complement of qualified researchers may sit around the table planning comprehensive research on a broad ecological basis, and then work together as a team to solve the problems of complex biological relationships? Organizations such as this, we believe, are all to the good.

In the wildlife field, a potent force for the integration of research (fact-finding) is the money provided by the Pittman-Robertson Federal Aid in Wildlife Restoration Act. A statement of the net obligations by type of projects covering the fiscal years 1939 through 1953[2] shows a total of $72,000,000. More than $16,000,000 went into surveys and investigations to provide better facts on which to base wildlife management. We know of no comparable funds for forestry or range research, but through integration wildlife studies benefit the others, as a few examples will indicate.

In California, a project entitled "Game Range Restoration" (W-46-R-3) is supervised by personnel of the California Department of Fish and Game, the leaders are Forest Service technicians, and the project clears through the Fish and Wildlife Service. In the same state watering devices for quail, some of them on national forests, are paid for by the state from Pittman-Robertson funds.

In Nevada, the 2,200,000-acre Desert Game Refuge administered by the Fish and Wildlife Service on Bureau of Land Management lands is an important area for desert bighorn sheep appraisal by personnel of the Nevada State Fish and Game Commission under Pittman-Robertson project W-3-R. The list could be extended, but these few should give same inkling of the incalculable effect of the act on the progress of wildlife investigations and management.

Often Pittman-Robertson project areas can be of especial interest to the range manager, as for example in Washington. The Washington State Game Department has purchased areas varying in size from 10,000 to 60,000 acres or more—the Sinlahekin, Methow, Pothole, and Oak Creek Game Ranges to name a few—where wildlife is to be studied and managed. These areas are usually closed to livestock after purchase and the resulting vegetation recovery provides a basis for developing range condition standards and trends, both for big game animals and livestock. These are large-scale demonstrations of the potential productivity of the range.

Pittman-Robertson funds, by virtue of the regulations under which they are expended, offer little help to forest and range managers on one of their major problems, that of wild animals injurious to forest and range. Presumably, such studies might be handled by biologists in the Section of Wildlife Investigations on Public Lands, a section in the Branch of Wildlife Research, Fish and Wildlife Service.

However, there are only eight of them to work on such problems on an area of some 400,000,000 acres. Even if they were to devote their entire time to studies of injurious rodents, which because of other research requirements they are unable to do, they would still be able to contribute only a minor fraction of the research effort necessary for a realistic attack on these problems.

Lacking adequate personnel to assign specifically to this problem, the team approach has been considered. Recognizing that many agencies are engaged in some phase of this type of work and could contribute something towards the solution of these problems, a program is underway to employ technicians capable of supervising a range ecology study and of serving as a clearinghouse for all those agencies capable and desirous of participating. Something of this nature is already underway in the study of methods to control rodents in reforestation, a project being supervised by the Denver Wildlife Research Laboratory in which 10 national forests, 4 forest and range experiment stations, 2 state forestry departments, 3 state fish and game departments, 7 private timber companies, including some of the largest in the country, are cooperating.

4. INTEGRATION OF ADMINISTRATIVE RESPONSIBILITIES: *In the West public lands are largely administered by federal agencies; wildlife as elsewhere, by the states.*

To the extent that wildlife is manageable, the states play a predominant role, a fact well recognized by public administrators. Typical of their attitude is a statement by the chief of the Forest Service[3] which lists as one of the two major approaches to wildlife management, ". . . the maintenance of close cooperative relationships with the state fish and game departments."

In turn, the federal agencies specifically reserve to themselves the management of watersheds, timber, range lands, and wildlife habitat. With responsibilities thus divided, and the states usually controlling smaller areas than the federal land management agencies, state wildlife administrators are in a position to take the lead in integrating activities of mutual concern. Thus in Colorado, in a consideration of big game-livestock allocations, when the Bureau of Land Management proposed one system and the Forest Service another, the State Game and Fish Department asked that the matter be reviewed and a single method adopted.

A further factor which places the state in a central position is that wildlife, over which the state assumes responsibility, roams over forest and range, whereas watersheds, timber and grasses are stationary. Certainly in any attempts to integrate the responsibilities for these resources, the state game and fish departments can have a major part.

Integration of responsibilities among federal agencies is equally important. The great bulk of public lands exclusive of Alaska are in the West under the administration of the Bureau of Land Management and the U. S. Forest Service. Other federal agencies with large acreages include the Bureau of Indian Affairs, the National Park Service, and the Fish and Wildlife Service. Public laws, appropriations acts, and cooperative agreements both general and specific, provide for the formal integration of activities of federal agencies.

The Coordination Act of 1934 (10 March 1934: 48 Stat 401) as amended in 1946 (14 August 1946: 60 Stat 1080: 16 USC, 661-666) which provides for a review by the federal and state agencies concerned of water impoundment or diversion projects is a good example. Another is the McSweeney-McNary Forest Research Act (22 May 1928: 45 Stat 701) which makes essential provisions for research on forestry and wildlife; and still another is the Taylor Grazing Act (28 June 1948: 48 Stat 1269 and amendments) which besides regulating grazing protects hunting and fishing rights of the public.

Despite some overlapping of major responsibilities, top administrators in central offices seem to have available a sufficient body of laws, directives, and policy statements to pass on to top field administrators to take care of the necessary formal cooperation.

The situation among the higher field

[2] Rutherford, Robert M. Five years of Pittman-Robertson wildlife restoration 1949-1953. Wildlife Management Institute, Washington, D. C. 1954.

[3] U. S. Dept. Agric. Report of the chief of the forest service. Page 26. 1953.

offices, where staff functions decrease and line activities commence, becomes more difficult. In fact, it may be that major problems of integration tend to collect at this level. Let us briefly consider some of the factors involved.

Usually the job of administering a region is a big one and not infrequently personnel and funds are rather stringent. The good administrator tailors activities to handle the work in his area as he conceives it to the best of his ability. An important part of his job is cooperation with other agencies, but the amount of cooperative effort he is able to offer to other agencies may depend to a large extent on how a particular assignment fits in with his general program.

When we look at a map which shows how such agencies as the Forest Service, the Bureau of Land Management, and the Fish and Wildlife Service, to select those which concern us most, are regionalized, we see that, exclusive of Alaska, the Forest Service has nine regions, the Bureau of Land Management four, and the Fish and Wildlife Service five. No two of the regions are identical and seldom do boundaries coincide.

We cannot take the time here to dig into the details of specific cases where cooperative effort and integration of activities are called for and fail, but we are confident that such difficulties exist. A case in point is the operation of Department of the Interior Field Committees which coordinate the activities of the various agencies in that Department as they concern a particular river basin. The discussions of a Field Committee go a long way toward ironing out iteragency difficulties, but how much more difficult must be the problem of coordinating the work of the regions of different departments where these regions concern markedly different areas. Nothing in these remarks should be construed as a criticism of any agency, but rather as a suggestion to look at the pattern of integration to see if the gears of the natural resources machine are meshing as they should.

At the lower administrative levels, the personnel of different agencies appear to coordinate their efforts more easily, possibly because problems are less difficult and areas smaller, and possibly, too, because of bonds of common interest and the catalytic effect of personal friendships. Within the limits of their authority, men in the field often make directives work well simply through personal and intimate knowledge of local areas and conditions, and a determination to do a good job. But we should face the fact that the contrary situation can come about where opposing views result in the bitterest of altercations. In such situations, better integration at higher levels will go a long way to iron out difficulties.

5. SOME PROBLEMS AND METHODS OF INTEGRATION: *Effective integration requires mutual understanding of objectives, the meaning of terms, the nature of the resources involved, and the limits of the areas under discussion. There needs to be a suitable forum where diverse opinions can be presented and considered impartially.*

Your committee recognizes that multiple use is an accepted administrative policy for all the areas where the public in its major groupings—foresters and loggers, ranchers and stockmen, recreationers, miners, conservers and users of waters and wildlife, and possibly others — claim moral or legally vested rights. And it might seem unnecessary and redundant to attempt to define so self-explanatory a term, but multiple use often means different things to different people. We believe there are two elements in the concept which merit closer inspection.

First, the application of multiple-use management may be of voluntary or involuntary origin. The former is typified by public lands; the latter, by private lands. Multiple-use management on public lands is a definite and traditional part of the structure under which they have been established and administered. The policy is well expressed by the Society of American Foresters[4] which ". . . subscribes to the principle of multiple use of forest and other wild lands, meaning by that a conscious effort to manage each unit of land for its highest sustained productivity." On private lands, however, different purposes usually pertain, but still multiple use is not excluded.

Where is there an area of wild or agricultural land, public or private, that does not to a greater or lesser degree have some sort of multiple use? This may be stretching the usually accepted meaning of the term considerably, yet inevitably plant and animal species tend to occupy areas favorable to their existence. The presence of such species frequently forces the land owner or manager into a program of multiple use; as for example, in the case of the farmer or rancher who welcomes hunters to reduce overabundant game species, or the state refuge keeper who carries on a fence post sale to keep the forest open for big game.

The second point is that the term multiple use can be interpreted as meaning almost anything the interpreter wishes. Somehow, in the evolution of concepts about wild land management, multiple use came to signify to many a Utopian situation where all creatures and activities could be accommodated. Without wishing in any way to detract from the basic good in the concept, your committee emphatically renounces any interpretation, which without careful consideration of the pertinent factors involved in a particular situation, says in effect "What is good for this is good for that."

Good watershed management may or may not be good for wildlife; good timber management usually does not favor forage production; and, paradoxical as it may seem, good wildlife management may not be good recreational management, a point not infrequently in contention between sportsmen and the administrators of closed areas. Multiple-use medicine should be prescribed by a doctor, not sold offhand at the corner drug store.

A somewhat more formal approach to the problem is that of land-use planning. Problems of land use are not new to conservationists, neither are the procedures for attacking them. Numerous examples of successful land use programs range from detailed maps of small areas to extensive programs involving millions of acres, but in the interest of brevity we omit them here.

In studying the problems of integration, we have been squarely confronted with the need for a central point of focus, a rallying point around which divergent interests can gather for consideration. We believe a written plan of land use for the area involved, complete with maps and statements of purpose, can best serve such a purpose.

The land-use plan or program presents many possibilities: It establishes a definite target or area of reference; it provides for consideration of all the multiple uses proposed for an area; it facilititates the keeping of records and scheduling of reviews; it exposes weaknesses in our knowledge by assembling in one place all available information, and thus encourages contributions towards completion of the whole picture, a very important point, considering our gross lack of knowledge about many of the factors of ecology

[4]Policy on Multiple Use. JOUR. FORESTRY 46:15. 1948.

and biology essential to intelligent management.

And possibly most important of all, it lends itself to orderly discussions from which can develop agreements, disagreements, or arbitrations. In fact it is a bid for a judicious, not to say judicial approach to the problem of conflicting interests on the same piece of ground; in other words, multiple use.

6. CONCLUSIONS: *Wherever wild land problems occur there are possibilities for better integration and more timely action.*

Frequently, the attention we give to wild land problems in the way of planning, research, or management is too little and too late. The manifestations of this are various. In some cases incipient differences, if neglected, expand in an atmosphere of misunderstanding or unilateral interests into major conflicts more characterized by heat than light. A few examples may suffice to illustrate our meaning.

In the West, water rights furnish a classical battleground. With regard to watershed management, a report of the American Forestry Association[5] recognized 470,000,000 acres of commercial and noncommercial forests as having at least a moderate watershed protective influence. Of this total, 300,000,000 acres of commercial forest lands and 65,000,000 acres of noncommercial forest lands were considered to be in an unsatisfactory condition in 1945. Although the report points out that gains are being made through fire protection, conservative cutting and logging, tree planting, grazing controls, and the like, it is obvious that some time in the past our understanding of the importance of water has been entirely inadequate and our management of watersheds inept or ineffective.

Grazing on western ranges carries with it the seeds of numerous conflicts. Largely for the protection of livestock, wolves have been exterminated to all intents and purposes in the western half of the United States. Some day, if control methods continue to improve and land utilization intensifies, other wild species may go the same way. For a time it appeared that the grizzly bear, because of its predatory habits, must face extermination in Colorado, but through the efforts of the Colorado State Fish and Game Department and the U. S. Forest Service, an area has been set aside for its partial protection.

Besides the conflicts between livestock and predators, we have the difficulties that arise between big game and livestock on the same ranges. This problem is recognized in each of the western states and from time to time smoldering resentment flares into open conflagration. Such was the case a few years ago in Wyoming's Red Desert where fencing for better sheep management was excluding pronghorns from water and range. Belatedly, in January 1952 a big-game biologist was assigned to study the situation and a preliminary report of his findings is now available.

The range itself poses a serious problem which for solution will require the coordinated efforts of many agencies and individuals. Typical of the outlook of some public range managers is that of Karl S. Landstrom[6] who writes as follows:

> "By and large, the public range, though constituting a major part of the Western livestock base, is low in productivity in relation to past and potential conditions. The Pacific bunchgrass type in Idaho, Oregon, and California has withstood unregulated grazing poorly. Annual grasses have infiltrated, greatly reducing grazing capacity and increasing fire hazards. Sagebrush grasslands in Oregon and Idaho now have only a third of the productivity that they should and might have. Weeds have turned the range into a reservoir for virus plant infections and a breeding ground for damaging insects.
>
> "The public range has suffered over the years from overuse, drought, fire, and other causes. The cumulative depletion in terms of soil erosion, siltation, excessive water runoff and other damage is severe.
>
> "Depletion, serious in its own right, has been intensified in economic effect by strong and expanding demands for range livestock and by reductions in availability of range for grazing . . . owing to exclusions for watershed protection and other uses. Irrigation development of rangeland areas has reduced the area available for range, altered the range economy, and increased the demand for range livestock to be fattened on irrigated pastures."

A serious problem in northern Midwest States concerns wetlands. State fish and game organizations have been engaged in a program of restoring marshes, potholes, and other wetlands for the benefit of wildlife under the Pittman-Robertson program. At the same time, farmers have been paid government subsidies for drainage.

These few cases, which indicate that somewhere or somehow our efforts have been too little and too late in the matter of resource management, should be ample to illustrate our point. And although there is no guarantee of success regardless of the promptness or the completeness with which we atempt proper land use, we can take some measure of comfort if we succeed in bringing our case to court for a full and complete hearing: we must not lose by a judgment of default. We must not be led astray by team research, which is in fact single-purpose research. We must not overlook the fact that most land-use problems have ceased to be qualitative in nature and have become quantitative. We must recognize the fact that if we would continue to improve our management practices we must have constantly better information.

DAVID F. COSTELLO
RALPH R. HILL
PAUL HICKIE, *Chairman*

[5] American Forestry Assn. Watershed management. The Conservation Yearbook. Page 91. Eric Kauffman, Editor. 1954.

[6] Landstrom, Karl S. Conservation of the public range. Our Public Lands 1(1):4. 1951.

Division of Private Forestry

The annual meeting of the Division of Private Forestry was held in Milwaukee on the afternoon of October 26. About 200 persons were in attendance when Chairman E. Stanley Hurd opened the meeting.

A paper on "The Lake States Council of Industrial Foresters. What Is It?" was presented by Bruce G. Buell of the Northern Paper Mills, Green Bay, Wis. Upon questioning from the floor, Mr. Buell stated that the research findings of the Council of Industrial Foresters will likely continue to be published by the cooperating organizations or possibly by the Council itself should no other outlet be available.

Bruno L. Berklund of the Nekoosa-Edwards Paper Company, Port Edwards, Wis., then presented his paper entitled "Industry Forest Management Research in the Lake States." Discussion followed relative to the desirability of the Industry having specialized research forests.

Chairman Hurd called for the report of the Nominating Committee which nominated the following slate of officers who were unanimously elected:

Chairman, William G. Hagenstein, Industrial Forestry Association, Portland, Ore.

Vice chairman, Arthur W. Nelson, The Flintkote Co., Meridian, Miss.

Secretary, Clarence Richen, Crown Zellerbach Corp., Portland, Ore.

Following the election of officers, W. H. Cummings and F. H. Kaufert presented a paper on "Industry Forest

Management Research in the United States," a report of the S.A.F. Forestry Research project.

Other industries actively interested in the development of forest resources were detailed in companion papers. R. H. Ewalt of The Cleveland Cliffs Iron Company, Negaunee, Mich. spoke on "Forests and the Mining Industry in the Lake States." The paper presented by W. A. Kluender, of the Chicago and Northwestern Railway System of St. Paul, Minn., dealt with "Railroads and Forestry in the Lake States."

The final report of the afternoon was given by M. N. Taylor of Trees for Tomorrow, Inc., Merrill, Wis. His paper entitled "Trees for Tomorrow—An Industrial Approach to Resource Management" was illustrated graphically with charts and pictures.

EDWIN J. JANKOWSKI
Secretary

Division of Public Relations

One hundred and twenty-five foresters participated in the meeting of the Division of Public Relations, October 25, 1954, during the annual meeting of the Society in Milwaukee. Ralph Unger, division chairman, presided.

M. N. Taylor, executive director, Trees for Tomorrow, Inc., Merrill, Wisconsin, read a paper "Trees and People."

Mr. Taylor's paper was discussed by C. W. Mattison, of the Forest Service, Washington, D. C.

In describing a forestry public educational effort carried on by a public agency, Edward J. Lott, extension forester, Indiana, told of his state's organization where there are five extension foresters rather than the one common to many states.

K. E. Barraclough, extension forester, New Hampshire, discussed Mr. Lott's paper.

There was no old or new business. Election of new officers will occur at the Portland, Oregon, meeting in 1955.

C. W. MATTISON
Secretary

Division of Range Management

The 1954 meeting of the Division of Range Management was held Wednesday afternoon, October 27, in the South Room of the Hotel Schroeder. Chairman M. W. Talbot presided, and introduced the panel discussion with a brief dissertation on the national and world-wide implications of the theme of the meeting—"Integration of Grazing and Timber Growing." Papers on this basic theme were presented by five regional experts.

Robert S. Campbell of the Southern Forest and Range Experiment Station, New Orleans, La. discussed "Forest Grazing in the Deep South." Illustrated with color slides, this paper emphasized the value of moderate grazing as a fire control measure, and the importance of grazing at the right season.

Fred B. Trenk, Extension Service, University of Wisconsin at Madison, presented the "Effect of Grazing on Timber in the Lake States." Advocating the development of grassland pastures and corresponding lighter use of woodlots for grazing, Mr. Trenk stated that most woodlots are not grazed because they are good pasture, but because they are the only available pasture.

S. Clark Martin, Central States Experiment Station, Columbus, Ohio, spoke on "Grazing and Timber Production in the Ozarks." Showing that most of the studies that prove grazing and timber growing to be incompatible are based on high stocking rates and destructive utilization, Mr. Martin stated that multiple-use of forest lands, under good management, is practicable in the Ozark Region.

Arnold O. Heerwagen, Soil Conservation Service, Denver, Colo. interestingly briefed the research results and studies of "Grazing and Ponderosa Pine Reproduction in the Rocky Mountains and the Southwest." His conclusion was that timber growing and grazing use are mutually compatible in this widespread area.

Donald E. Colwell, Cascade Lumber Co., Yakima, Wash. represented private industry, and proved his company's interest in range management in a paper entitled "Harmonizing Forestry and Range Management in the Pacific Northwest." Mr. Colwell, who is logging superintendent in charge of timber management, described the intensive range management now being practiced on company holdings. A range technician has been hired, extensive water development, fencing, and reseeding projects are under way and multiple-use management, including full attention to water production, is being practiced; $4 per cow per month is charged for grazing use.

Discussion following each paper was limited to five minutes. In conclusion Chairman Talbot briefly summarized the broad points made by the panel speakers.

No election was held at this meeting, since the present officers felt that all members-of-record of the Division should be allowed to vote for officers. The slate of officers prepared by the nominating committee is therefore being submitted to the membership by mail.

BERT H. TUCKER
Secretary

Division of Silviculture

The Silviculture Division meetings were held October 26, under the direction of Dr. J. W. Duffield, vice chairman, in the absence of P. A. Briegleb, chairman. A morning meeting was attended by approximately 300 people. The afternoon meeting had about 250 in attendance.

During the morning session seven papers dealing with a great variety of silvicultural subjects in several different regions were presented. Following is a list of their titles and authors:

1. "A Decade of Development in Forest Practices: 1940-1950." Kenneth P. Davis, Department of Forestry, University of Michigan, Ann Arbor, Mich.

2. "Some Results of Revising the Douglas-fir Yield Tables to Include Mortality." George R. Staebler, Pacific Northwest Forest and Range Experiment Station, Olympia, Wash.

3. "Early Growth Response of Central Hardwoods to Management." Leon S. Minckler, Central States Forest Experiment Station, Carbondale, Ill.

4. "Hardwood Tree Grades as a Silvicultural Tool in the Management of Cumberland Plateau Hardwoods." Henry W. Smith, Jr., Department of Forestry and Engineering, The University of the South, Sewanee, Tenn.

5. "Where Does Thinning Fit into the Management of Lake States Pulpwood Stands?" Otis Hall, School of Forestry, University of Minnesota, St. Paul, Minn.

6. "Upgrading Slash Pine Seed Sources." Kenneth B. Pomeroy, Southeastern Forest Experiment Station, Lake City, Fla.

7. "The Star Lake, Wisconsin, Plantations." Fred Wilson, forester, Madison, Wis.

The first part of the afternoon session was devoted to a panel discussion of the topic, *"Coordinating Silvicultural Objectives and Practices with Wood*

Quality and Species Requirements in the Forest Industries." Dr. T. D. Stevens of the Department of Forestry at Michigan State College acted as moderator. The symposium topics and panel participants included the following:

1. "Prospective Wood Quality and Species Requirements in the Forest Industries." J. A. Hall, Forest Products Laboratory, Madison, Wis. (Paper read by Mr. Harold Mitchell, U.S.F.S., Madison, Wis.)

2. "The Case for 'Cellulose' Forestry." Russell Watson, consulting forester, Manistique, Mich. (Paper read by Mr. George Banzhaf, Milwaukee, Wis.)

3. "Composition and Quality Objectives for the Aspen Type: Aspen Management in the Lake States." Z. A. Zasada, Lake States Forest Experiment Station, Grand Rapids, Minn.

4. "Silvicultural Problems in Central States Forests: Composition and Quality Objectives." L. E. Sawyer, Indiana Coal Association, Terra Haute, Ind.

5. "Successional Trends of Forest Vegetation and Future Wood Supplies." Henry L. Hansen, School of Forestry, University of Minnesota, St. Paul, Minn.

Following the panel and discussion from the floor the moderator summarized the highlights of the panel discussion.

A short business meeting followed during which new officers were elected for 1954-1955. A slate of nominees consisting of: T. E. Maki, School of Forestry, North Carolina State; and Carl Ostrom, Southeastern Forest Experiment Station, for vice chairman; and Don Baisinger, Crown-Zellerbach Corp. and George Staebler, College of Forestry, University of Washington, for secretary was presented on the basis of a report from the nominating committee. No additional nominations were made. A vote was held and Secretary Hansen and Philip Joranson acted as tellers. This resulted in the election of Carl Ostrom as vice chairman and George Staebler as secretary.

Following the election, committee reports were read as follows: *"Report of the Committee on Forest Tree Improvement"* by Scott S. Pauley, chairman. *"Report of the Committee on Natural Areas"* by John F. Shanklin, chairman.

A resolution was read by Stephen Spurr on recommendation of the Committee on Forest Practices as follows, and adopted:

The Division of Silviculture recommends to the Council for processing or publication by the Society the report "A Decade of Development in Forest Practices, 1940 to 1950" prepared by the Committee on Forest Practices and presented to the Division at the 1954 annual meeting. By digesting state legislation on forest practices, assembling an extensive annotated bibliography, and summarizing major happenings of the period as affecting forest practices, the Division feels that the report is of sufficient general interest and reference value to merit its reproduction.

HENRY L. HANSEN
Secretary

Committee on Natural Areas

This Committee being relatively young, now seven years old, is naturally somewhat impatient. It has endeavored to hasten progress toward the ultimate goal of having every recognized timber type preserved within an approved natural area. It has been disturbed with respect to the almost total lack of silvicultural research within natural areas. It has been concerned over its inability to promote the program generally within the wood using industry. Every year when it is called upon for a progress report, a period of stock taking ensues followed by a sense of irritation as to the slowness of real progress.

Specifically, the Committee can say that the revised listing of approved natural areas was published in the May 1954 issue of the JOURNAL, Volume 52, No. 5 on pages 375-383. Reprints are available. This revised listing was prepared in accordance with the type numbers and terminology as found in the new *Forest Cover Types of North America.*

The September 1954 issue of the JOURNAL carried an article entitled "Natural Area Research" which reviewed the research work being carried on in foreign countries as related to natural areas. The conclusions reached were that we in this country are lagging behind in this particular field. In this connection, it does appear from rather brief contacts one member of the Committee has had with representatives of France and England that the governments of these two nations understand the values of natural areas better than we do in this country and accordingly there is greater effort toward the establishment of natural areas.

The April 1954 issue of the JOURNAL carried an article on Mettler's Woods which is the story of an attempt to raise funds with which to purchase a virgin tract of timber in northern New Jersey and place it in the hands of Rutgers University for research and educational purposes. As of September 1, $44,893 had been raised for the purpose—only $30,107 is now needed. All members of the Division of Silviculture should read the November 8 issue of *Life Magazine* which will carry as a part of Chapter 12 in the series "The World We Live In" an article on Mettler's Woods. The Committee takes no credit for this story, but does wish to emphasize that it will continue to support all efforts to set aside natural forest areas for research and education.

A year ago, the Committee was still embodied with enough of the go-getter spirit as to state in its annual report that discussions were being held with the National Distillers Products Corporation for the setting aside of a small tract of land in Missouri carrying virgin white oak. Now a year later it may be reported, with some hesitation, that discussions are still going on, but with a different company as the corporation has sold its holdings. At this writing, negotiations are proceeding with the University of Missouri in the hope that that institution will accept the responsibility for the Society of maintaining the offered white oak type as a natural area. The Committee is very hopeful that by another year the consummation of this project may be reported.

Furthermore, another example of the interest executives of lumber companies may have in the natural area program has been brought to the Committee's attention. The Lee Tidewater Cypress Company has donated 640 acres of merchantable cypress located in Collier County, Florida to the Audubon Society to preserve a portion of an area known as the Corkscrew Swamp, long recognized as an important ibis and egret rookery. The full story on this appears in the May-June 1954 issue of the *Audubon Magazine,* page 102.

The Committee, in an endeavor to broaden interest in the natural area program, has sent under date of September 21 to some 40 wood using and conservation associations an article on the natural area project of the Society. It is our hope that a majority of these associations will publish the article, or a condensation thereof, and that general interest will thereby be broadened.

In general we think it may be said that your Committee has endeavored to foster a sustaining interest in the need for more natural areas as well as the availability of existing natural areas for research. The extent of our success may only be measured in the future.

JOHN F. SHANKLIN
Chairman

Committee on Forest Tree Improvement

At the meeting of the Division of Silviculture in Colorado Springs, September 14, 1953, motions were passed as follows:

1. That the Chairman appoint a Committee on Forest Tree Improvement to keep abreast of tree-improvement research and developments, encourage research, promote application of genetic principles in silviculture, summarize information, and encourage publication of articles in the JOURNAL OF FORESTRY; that the chairman select the committee with the help of members of the Division especially interested in forest genetics.
2. That the Division recommend to the Council that an associate editor of the JOURNAL OF FORESTRY be appointed to handle papers on forest genetics, and papers in those related fields, such as artificial regeneration or silvics, which the Editor and Council think will properly divide the load of the associate editor in the silvicultural field; that the new Tree Improvement Committee will suggest to the Council for their consideration, an appropriate individual for the proposed new associate editor position.

In a letter dated September 29, 1953, the then chairman of the Division, Russell K. LeBarron, appointed the present members of the Committee on Forest Tree Improvement.

In accordance with motion *2* above, the first business function of the newly constituted Committee was concerned with the selection of an associate editor in the field of forest genetics and artificial regeneration. By vote of the Committee, Philip C. Wakeley was recommended to the Council and was subsequently appointed.

In order to insure continuity of the Committee's activities, the following recommendations for r e n e w a l and change of membership were submitted to the Division of Silviculture:

1. The Committee shall consist of seven members, one of whom shall be appointed chairman.
2. The Chairman shall be appointed for a term of three years.
3. Two of the other six members of the Committee shall be appointed for a term of one year, two for a term of two years, and two for a term of three years. As these terms expire, new members shall be appointed for a term of three years, thereby insuring two new members each year.
4. An effort should be made to insure as complete regional representation on the Committee as possible.
5. Since situations may arise in which it would be clearly to the advantage of the Committee, the Division, and the Society, to have some individual remain on the Committee for a longer period, the suggestion is made that committee members shall be considered eligible for reappointment.

Early in the year, at the request of Associate Editor Wakeley, the Committee prepared an outline of proposed subjects for inclusion in the special tree improvement issue of the JOURNAL. All the considerable editorial labors involved in the preparation of the special tree improvement issue were, however, borne by Wakeley and Arthur Meyer. In recognition of their valuable services in contributing to a better understanding of the role of genetics and its applications in forestry, the Committee extends to them a unanimous vote of thanks.

Of the several duties or fields of action recommended for the Committee on Forest Tree Improvement by the Division of Silviculture, the Committee is agreed that the most important are "to encourage research in forest tree improvement" and "to promote the application of genetic principles in silviculture." The intangible nature of these objectives does, however, discourage any hope for direct action, and the Committee has thus been forced to accord priority to those activities which, indirectly, may serve to encourage continuing interest and research activity in this field.

To implement this policy, the Committee is in agreement that it shall assume responsibility for the preparation annually of a report or summary of tree improvement research in progress in the United States and Canada. The report will also include a check list of agencies and personnel engaged in such research, their addresses, and notations of the specific material with which each is working. It is planned that the summary will also include, if practicable, a report of current developments in forestry education that have bearing on the problems associated with the training of research workers in the field of forest tree improvement. The Committee has already solicited reports on this subject from all forestry schools in North America, and these will form the basis of the section on education in the 1954 report. Preparation of the current report will be undertaken by Jonathan W. Wright.

The Committee has decided to prepare for publication a glossary of genetic terms designed specifically for the use of foresters. Bruce Zobel has agreed to assume responsibility for the project, and a deadline for final review of the manuscript by the Committee has been set for October, 1955.

The Committee has given rather exhaustive consideration to the problem of increasing the availability of specialized graduate training in the field of forest genetics and allied basic disciplines in forestry schools, particularly as such training relates to the preparation of men properly equipped to carry on basic or applied research in forest tree improvement. Although this Committee can do little directly, the Committee members feel that the problem might be profitably reviewed as a panel discussion or symposium in collaboration with the Division of Education at the next annual meeting of the Society.

J. W. DUFFIELD
H. E. FOWELLS
F. I. RIGHTER
J. W. WRIGHT
S. N. WYCKOFF
B. ZOBEL
S. S. PAULEY, *Chairman*

Division of Watershed Management

The annual meeting of the Division of Watershed Management was held in the South Room of Hotel Schroeder, Milwaukee, from 8 p.m. to 10:30 p.m. October 25, 1954. The program was a panel discussion on the subject "Do Foresters Face Watershed Management Problems in the Lake States?" Participating in the program were:

P. A. Herbert, moderator, Division of Conservation, Michigan State College, East Lansing, Mich.

Chester S. Wilson, Minnesota Department of Conservation, St. Paul, Minn.

R. D. McCulley, Lake States Forest Experiment Station, U. S. Forest Service, St. Paul, Minn.

Robert A. Petry, Nekoosa-Edwards Paper Company, Port Edwards, Wisc.

David N. Kee, Superior National Forest, Duluth, Minn.

Following the presentations by the panel members a spirited question session was held.

Chairman Marvin Hoover announced that mail ballots were to be sent out and returned by November 20 for the election of divisional officers for 1955.

It is estimated that more than 175 persons attended all or part of the meeting indicating the increased interest in watershed management.

EDWARD A. JOHNSON
Secretary pro-tem

Central States Section Holds Annual Meeting

The annual meeting of the Central States Section was held in the Schroeder Hotel, Milwaukee, on Sunday night, October 24, preceding the national meeting of the Society. Reports were submitted by various committees and officers.

Officers elected for the 1954-55 year were R. H. Grabow, Bedford, Indiana, re-elected chairman, and R. W. Merz, Athens, Ohio, elected vice-chairman. C. S. Walters, Urbana, Illinois, will complete the final year of his two-year term as secretary-treasurer. E. R. Martell, Lafayette, Indiana, has been appointed program chairman and will serve with the elected officers on the Section's executive committee.

With the Lower Michigan Chapter affiliating with the Wisconsin Michigan Section, recommendations were made and approved to reduce the secretary-treasurer's annual honorarium from $100 to $65. The Section voted to continue the practice of awarding Junior Membership and a tie chain with the Society pendant to the outstanding forestry graduate at Purdue University. The Section initiated the award several years ago when three forestry schools were located within the Section's boundaries.

The President's Column

We are now entering a new year. May 1955 be good to each of you!

Your Council has one more year to serve. Later on this year, you will be given an opportunity to select a new slate of officers for the 1956-1957 term. I will not be a candidate for re-election.

The membership campaign of 1954 paid off. Membership now exceeds 10,000. But let us not be satisfied until all qualified foresters are in the ranks of the Society.

A sizeable number of members are lost each year from death, resignation, or nonpayment of dues. There may be good reason for certain resignations, although we all regret losing qualified members. There is no good reason, however, to be dropped for nonpayment of dues—in view of your Society's provisions:

1. Members temporarily serving in the Armed Forces are placed on the inactive list if so requested. They resume active status upon return to civilian life, with the payment of current dues.

2. Members or Fellows who retire from active forestry practice after having been members of the Society for 20 years or more may, upon application to the Council, continue as voting members but have their dues remitted except for an annual charge of $5 should they desire to receive the JOURNAL OF FORESTRY.

3. For members who were dropped from the rolls during past years the Council has agreed to remit all past dues for one year only (1955), during which time they may request reinstatement. I hope that many of these former members will return to the fold. They will be most welcome. But let us make all of our members feel that they are an integral and necessary part of the Society so that they will want to continue membership in the only professional forestry organization in this country.

I want to commend the good work of the officers and committees who have labored so diligently in the Chapters, Sections, and Divisions during the last year. It is in these groups that most members can take part in Society activities, and contribute to the objectives of the Society. Let us all work to keep these vital parts of our organization active.

Although I have tried to maintain close touch with the members through my monthly "columns" during the past year, these have failed to elicit many comments. However, I will continue to inflict them on you for the balance of my term as President, as they give me an opportunity for rambling thoughts on how I feel we can build a more useful and effective Society, to the benefit of the members, the profession and the public.

E. L. DEMMON

SCHOOL BOX SCORE
MEMBERSHIP, 1955 FISCAL YEAR

School	Student applications received: Jan. 1955	Total 1954 fiscal year	Total 1955 fiscal year
Alabama Polytechnic Inst.	0	7	18
University of California	10	21	10
Colorado A & M College	0	18	0
Duke University	0	12	1
University of Florida	2	16	2
University of Georgia	4	38	14
University of Idaho	0	29	0
Iowa State College	1	32	4
Louisiana Polytechnic Inst.	0	0	0
Louisiana State University	13	14	13
University of Maine	3	16	7
University of Massachusetts	2	16	6
Michigan State College	2	25	28
University of Michigan	0	22	6
University of Minnesota	2	21	4
University of Missouri	0	20	7
Montana State University	10	19	10
State University of N. Y.	8	23	13
North Carolina State College	0	19	20
Oregon State College	1	17	4
Pennsylvania State Univ.	18	33	24
Purdue University	0	19	24
Utah State Agri. College	6	8	7
University of Washington	5	28	15
West Virginia University	1	21	4
Yale University	2	3	3
Totals	90	497	244

SECTION BOX SCORE
MEMBERSHIP, 1955 FISCAL YEAR

School	Applications received[1]: Jan. 1955	Total 1954 fiscal year	Total 1955 fiscal year
Allegheny	20	68	29
Appalachian	1	48	25
Central Rocky Mountain	1	26	1
Central States	1	80	58
Columbia River	3	56	8
Gulf States	13	57	20
Inland Empire	0	39	1
Intermountain	7	14	8
Kentucky-Tennessee	0	5	0
New England	9	54	19
New York	9	40	16
Northern California	12	34	13
Northern Rocky Mountain	10	35	10
Ozark	6	49	13
Puget Sound	5	61	17
Southeastern	9	128	40
Southern California	0	2	0
Southwestern	0	7	0
Upper-Mississippi Valley	4	64	9
Washington	0	7	1
Wisconsin-Michigan	3	11	5
Totals	113	885	293

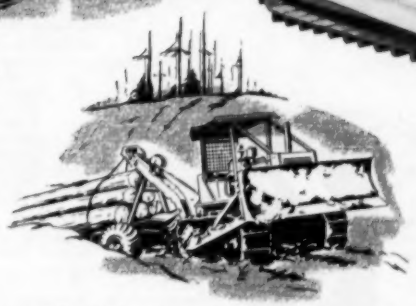
[1]Student, Junior, Affiliate, Associate (Initial) grades only.

Woods Ability is Built into this Tractor

feature by feature

These Attachments help widen the usefulness of the hard-working HD-9

Single and Double Drum Hoists and Winches

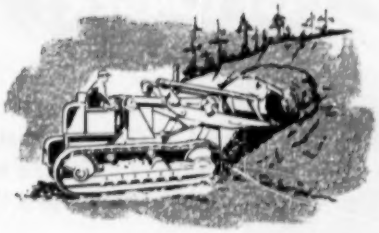


Logging Arches and Carts

Allis-Chalmers HD-9

18,800 lb (bare tractor)
72 drawbar hp
Six speeds forward to 5.7 mph
Three speeds reverse to 4.4 mph

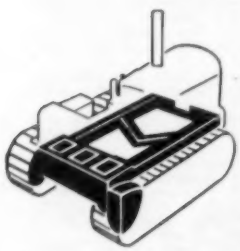
Straight and Angle Blade Dozers — with Cable or Hydraulic Control



Front-End Shovels, Lift Fork and Crane

The Allis-Chalmers HD-9 Tractor offers not only great productive ability, but also reliability and ease of servicing that pays off on all kinds of work in the woods. Here's what we mean:

BUILT TO STAND THE GAFF OF DAILY USE FOR YEARS

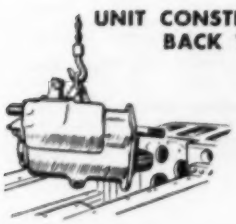


One-piece, welded main frame forms a continuous, strong backbone that means longer life for each tractor.

Smooth-shifting power train gives extra life, greater ability to absorb the punishment of tough jobs for every gear, shaft and bearing.

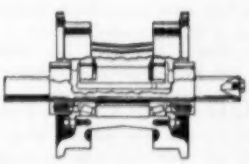
A-type truck frames permit free track oscillation and eliminate twists and strains caused by rough terrain.

UNIT CONSTRUCTION PUTS TRACTORS BACK TO WORK SOONER



Unit construction allows removal of major assemblies such as engine, clutch, transmission, steering clutches or final drive without disturbing adjacent assemblies, for big savings in downtime.

EASIER LUBRICATION SAVES TIME, HELPS PROTECT EQUIPMENT



Lubrication for 1,000 hours for final drives, truck wheels, idlers and support rollers saves both grease and time.

Spring-loaded, positive seals keep grease in, keep dust and water out.

Fewer, more accessible lubrication points make short work of a chore. No lube points at all under tractor.

Let your Allis-Chalmers dealer tell you more about the rugged construction, ease of servicing and outstanding performance ability of the Allis-Chalmers HD-9 Tractor.

ALLIS-CHALMERS
TRACTOR DIVISION · MILWAUKEE 1, U. S. A.

Dues Deductible

In filing U. S. income tax reports all members may classify dues and contributions to the Society of American Foresters as deductible expense.

Dues for 1955 should be paid now. Prompt payment reduces collection costs and enables the Society to budget expenditures more accurately. After June 30 members who have not paid their 1955 dues are declared to be in bad standing. Such members will be ineligible to vote, receive the Society's publications or be a candidate for office until their dues are paid. Get your check off today for 1955 dues.

Remission of Back Dues

Another reminder that on October 24th the Council voted to remit the payment of back dues of any former member who applies for reinstatement during the period November 1, 1954-December 31, 1955.

There are several thousand former members eligible now for reinstatement who can benefit financially by this action of the Council. Society members—especially membership committees of the Sections—are urged to contact all former members to get them to apply for reinstatement.

Membership Applications and Advancements

Proposals for admission, advancement, and reinstatement received in the Society office during the month of November are listed below.

Action on the eligibility of those proposed for membership as listed below will be taken by the Council as of February 1, 1955. Communications from voting members regarding the membership eligibility of these persons should be received in the Society office prior to that date.

The following Affiliate Members, forestry graduates of Louisiana Polytechnic Institute, have been advanced to Junior Members by action of the Council on October 24, 1954 in accrediting the Institute for professional forestry instruction.

Akin, J. W., Box 312, San Augustine, Texas.
Baker, J. F., 501 Broad Street, York, Ala.
Bozeman, E. B., 503 E. Lafayette, Winnfield, La.
Chandler, R. R., Box 262, Joyce, La.
Clark, B. M., Downsville, La.
Crawley, B. C., Box 486, Jonesboro, La.
Crowe, W. M., 500 Fairview, Bastrop, La.
Davis, B. H., Taylor, La.
Davis, B. M., Rt. 1, Box 116-C, DeQuincy, La.
Dopson, J. F., 3806 Cypress St., W. Monroe, La.
Durrett, R. D., 307 S. Farmerville St., Ruston, La.
Fallin, F., 210 Pinecrest Dr., Ruston, La.
Flick, A. W., 2109 Guilford Rd., Hyattsville, Md.
Futch, J. M., 510 N. Third St., W. Monroe, La.
Gaensehals, F., 3336 Youree Dr., Shreveport, La.
Gamblin, W. T., 3400 Lillian St., Shreveport, La.
Grigsby, R. L., c/o Soil Cons. Ser., New Albany, Miss.
Hinkie, J. B., 447 Third St., Jasper, Texas.
Hood, W. L., 325 N. Madison Avenue, Camden, Ark.
Horton, R. C., Comm. Amphibious Group 2, F.P.O., New York, N. Y.
Jiles, R. A., Box 4470, Duke Sta., Durham, N. C.
Lamkin, S. W., 113 Wetermark, Nacogdoches, Texas.
Leachman, J. C., International Paper Co., Box 4282, Alexandria, La.
Maxwell, R. D., Box 842, Jena, La.
May, L. C., Box 292, Huttig, Ark.
McKinney, T. J., 142 Jefferson, Natchitoches La.
Mudd, L. S., Box 409, Harlingen A.F. Base Texas.
Murphy, P. E., 112 Division St., Oakdale, La.
Peppers, L. W., P. O. Box 113, Jonesboro, La.
Richardson, R. E., Box 91, Elizabeth, La.
Russell, E. F., P. O. Box 314, Elizabeth, La.
Shipp, A. R., P. O. Box 22, Carrollton, Ala.
Smith, J. R., Route 2, Bernice, La.
Steen, C. N., P. O. Box 604, Olla, La.
Sutton, W. T., Route 1, Box 116-C, DeQuincy La.
Tannehill, W. M., Urania, La.
Walsh, D. H., 1004 Center St., Winnfield, La.
Wilson, E., S.W. Settlement & Dev. Corp., Jasper, Texas.
Zontek, 309 N. Mulberry, Tallulah, La.

Allegheny Section

Student Grade

PENNSYLVANIA STATE UNIVERSITY

Anderson, J. J.	Leasure, J. A.
Bergey, H. T.	Nagy, G. J.
Bobb, G. N.	Perdos, T. S.
Bommer, R. H.	Robertshaw, N. F.
Ellis, T. G.	Snoich, R. S.
Finkbeiner, J. M.	Tanski, J. P.
Frederick, L. E.	Webb, T. S.
Horn, K. D.	Wenner, R. P.
Hudick, J. F.	Yelnosky, G.

WEST VIRGINIA UNIVERSITY

Ware, K. D.

Junior Grade

Dunn, D. B., P. O. Box 217, Welch, W. Va.; W. Va. Univ., B.S.F., 1950.
Francis, J. M., Research Forester, Dept. of Forests & Waters, Harrisburg, Pa.; Pa. State, B.S.F., 1950. Reinstatement.
Paddock, J., Industrial Forester, Wyo. Valley Chamber of Commerce, Wilkes-Barre, Pa. (Affiliate, 1948).

Member Grade

Amos, J. R., Forester, W. Va. Pulp & Paper Co., Salem, W. Va. (Junior, 1948).
Barry, E. M., Epping Forest, R.F.D. 1, Annapolis, Md. (Junior, 1948).
Bartoo, R. A., Dept. of Forestry, Pa. State College, Pa. (Junior, 1948).
Blackstock, C. E., Asst. Dist. Forester, State of Md., Bel Air, Md. (Junior, 1948).
Bushman, R. R., Asst. Mgr., Lemirwood, Inc., Baltimore, Md.; Mich. State, B.S.F., 1949. (Junior, 1949).
Frankenburger, R. S., Asst. Dist. Forester, Dept. Forests & Waters, Clearfield, Pa. (Junior, 1948).
Hartman, H. M., Asst. Dist. Forester, Dept. of Forests & Parks, Cumberland, Md. (Junior, 1948).
Hawn, L. F., Pa. Dept. of Forest & Waters, Williamsport, Pa. (Junior, 1948).
Holsworth, C., Asst. Forester, N. J. Bureau of Forestry, Vineland, N. J. (Junior, 1948).
Lytle, C. R., Consulting Forester, 11 Bacon St., Wellsboro, Pa. (Junior, 1948).
Roper, R. M., Forest Ranger, East Orange Water Reserve, Millburn, N. J. (Junior, 1949).
Smalley, C. H., Forester, Armstrong Forest Co., Johnsonburg, Pa. (Junior, 1948).
Strasbaugh, R. M., Asst. Ranger, U.S.F.S., Marienville, Pa. (Junior, 1948).
Witherow, B. M., Instructor, Pa. State, Mont Alto, Pa. (Junior, 1948).

Appalachian Section

Junior Grade

Kalen, W. D., Forester, W. M. Ritter Lbr. Co., Hallsboro, N. C.; Iowa State, B.S.F., 1950.

Today, only one year after Nelson first introduced its revolutionary new paint—can—gun combination for marking trees, the paint has been further improved, and with volume from all over the world continuing to swell, the price has once more been reduced!

Today, using Nelson paint packed in *quarts* and marking trees the Nelson way costs less than the cheapest paint you can buy by the gallon, because—

1. YOU USE LESS PAINT
Nelson's new tree marking paint stays on the surface. You get more and brighter marks per gallon.

2. YOUR MARKS ENDURE
With the new Nelson marking paint, trees stay marked for years. (Ideal for Boundary Marking)

3. YOU SAVE TIME
No stirring, straining or transferring of paint. The NEL-SPOT gun using Nelson paint is always ready for use with no preparation of any kind.

Prove it!—For new lower prices, details, write Dept. JF-14

THE NELSON COMPANY 1234 Prospect Ave. Iron Mountain, Mich

Central Rocky Mountain Section

Junior Grade

Johnson, C. E., State Forester, State of Wyo., Cheyenne, Wyo.; Montana State, B.S.F., 1953.

Central States Section

Junior Grade

Arnold, W. D., Log Buyer, W. H. Arnold Lbr. Co., Hannibal, Mo.; Iowa State, B.S.F., 1952.

Member Grade

Argyle, W. B., Forester, Koppers, Co., Orrville, Ohio. (Junior, 1948).
Doerner, R. G., 314 Old P. O., Columbus, Ohio. (Junior, 1947).
Hollowell, R. E., 518 N. Delaware St., Indianapolis, Ind. (Junior, 1948).
McGinn, J. T., 308 W. Washington St., Chicago, Ill. (Junior, 25R42).
Pandel, C. R., 7261 S. Phillips, Chicago, Ill. (Junior, 1948).
Zuckerman, B. M., 385 Natural Res. Bldg., Urbana, Ill. (Junior, 1948).

Columbia River Section

Student Grade

OREGON STATE COLLEGE
Vandervelden, F. J.

Junior Grade

Easton, M. H., Resident Forester, Publishers Paper Co., Tillamook, Ore., Ore., State, B.S.F., 1948. Reinstatement.
English, R. B., Compassman, Weyerhaeuser Tbr. Co., Klamath Falls, Ore.; Univ. of Idaho, B.S.F., 1950.
Thompson, R. M., Logging Eng., Harbor Plywood Corp., Riddle, Ore.; Univ. of Maine, B.S.F., 1948.

Member Grade

Bartels, H. H., 3283 17th Ave. West, Eugene, Ore. (Junior, 1948).
Bjorklund, N. E., 1410 S.W. Morrison St., Portland, Ore. (Junior, 1948).
Clark, H. H., 77 Garfield St., Eugene, Ore. (Junior, 1948).
Glascock, H. R., Forester, Industrial Forestry Assoc., Eugene, Ore. (Junior, 1948).
Gross, D. C., 740 Ivan St., Roseburg, Ore. (Junior, 1948).
Hale, G. H., 13055 McKenzie Highway, Springfield, Ore. (Junior, 1948).
Howell, R. C., Inspector, Western Lane F.P.A., Springfield, Ore. (Junior, 1948).
Kalahan, C. R., Star Route, Castle Rock, Wash. (Junior, 1948).
Kummer, R. H., 1424 9th St., Longview, Wash. (Junior, 1948).
Lowrie, J. B., Route 1, Bardiner, Ore. (Junior, 1945).
Mezger, R. W., Box 3, Klamath Agency, Ore. (Junior, 1948).
Mohan, J. M., 728 N. 2nd St., Lakeview, Ore. (Junior, 1948).
Ogle, H. H., Dist. Warden, Klamath Forest Protective Assoc., Klamath Falls, Ore. (Junior, 1948).
Oglesby, H. B., Dist. Warden, Western Lane Forest Protective Assoc., Veneta, Ore. (Junior, 1948).
Ragland, W. E., U.S.F.S., Brookings, Ore. (Junior, 1948).
Ronayne, W P., Dist. Ranger, U.S.F.S., Estacada, Ore. (Junior, 1948).
Schroeder, J. E., Dist. Warden, Ore. Board of Forestry, Forest Grove, Ore. (Junior, 1948).
Sherman, A. E., Box 783, Brookings, Ore. Junior, 1948).
Smith, R. F., Consulting Forester, Rt. 3, Box 256 Sherwood, Ore. (Junior, 1948).
Steele, R. W., Wind River Expt. Forest, Carson, Wash. (Junior, 1948).
Todd, J. E., U.S.F.S., Tiller, Ore. (Junior, 1948).
Wahrgren, J. L., Pine, Ore. (Junior, 1948).
Walker, W. P., 6805 S.E. 20th St, Portland, Ore. (Junior, 1948).
Warren, A. L., U.S.F.S., Pendleton, Ore. (Junior, 1948).
Wilma, D. D., 2315 W. Castleman, Longview, Wash. (Junior, 1948).
Wilson, R. L., Teacher, Ore. State, Corvallis, Ore. (Junior, 1948).
Wycoff, E. B., Forester, Crown Zellerbach Corp., Seaside, Ore. (Junior, 1948).

Gulf States Section

Student Grade

LOUISIANA STATE UNIVERSITY

Barrett, R. E.
Bennett, F. C.
Burns, W.
Crocker, G. R.
Dark, B. R.
Foil, R. R.
Ford, J. C.
LaFosse, H. L.
Martin, B. W.
McConnell, J. L.
Purvis, G. M.
Reinhardt, E. J.
Smith, B. J.

Inland Empire Section

Member Grade

Brandenberger, R. O., Tbr. Mgmt. Asst. U.S.F.S., Pierce, Idaho. (Junior, 1948).
Ferrell, W. K., Asst. Prof., Univ. of Idaho, Moscow, Idaho. (Junior, 1948).
Herron, J. O., Asst. Ranger, U.S.F.S., Coeur d'Alene, Idaho. (Junior, 1948).
Morse, H. A., Forest Eng., Western Pine Assoc., Coeur d'Alene, Idaho. (Junior, 1948).
Parker, J., Asst. Prof., Univ. of Idaho, Moscow, Idaho. (Junior, 1948).
Potter, G. B., Chief Forester, Ohio Match Co., Coeur d'Alene, Idaho. (Junior, 1948).

Intermountain Section

Student Grade

UTAH STATE AGRICULTURAL COLLEGE

Bowman, K. J.
Brunson, R. H.
Lee, H. S.
Rueta, E. P.
Payne, R. W.
Picht, C. W.

Junior Grade

Mueggler, W. F., Rge. Conservationist, U.S.F.S., Ogden, Utah; Univ. of Idaho, B.S.F, 1949.

Kentucky-Tennessee Section

Member Grade

Anderson, W. R., Ranger, U.S.F.S., Elizabethton, Tenn.; Univ. of Minn., B.S.F., 1929. Reinstatement.
Berlin, D. E., Forester, Nickey Bros., Inc., Memphis, Tenn. (Junior, 1948).
Burger, C. E., Woodland Conservationist, Soil Cons. Service, Jackson, Tenn.; Mich. State, B.S.F., 1932. Reinstatement.
Holder, R. B., Cons. Forester, Champion Paper & Fiber Co, Knoxville, Tenn. (Junior, 1948).
Newman, J. A., Field Agent, Univ. of Ky., Barbourville, Ky. (Junior, 1948).
Vodak, R. C., Box 304, Cookeville, Tenn. (Junior, 1948).

New England Section

Student Grade

UNIVERSITY OF MAINE

Ludwig, J. E.
Stewart, B. E.
Stockbridge, J. T.

UNIVERSITY OF MASSACHUSETTS

Harrison, A.
Shenk, W. D.

YALE UNIVERSITY

Finlay, G.
Rock, D. A.

Junior Grade

Sargent, W. H., 1 Arbutus Rd., Swampscott, Mass.; Univ. of Mass., B.S.F., 1954.

Member Grade

Ames, J. S., 96 Ames Building, Boston, Mass. (Junior, 1923).
Archer, D. H., 47 Peatt Park, Ridgefield, Conn. (Junior, 1947).
Ashton, R., 10 Sunset Ave., Concord, N. H. (Junior, 1948).
Bartlett, E. W., 331 Main St., Salisbury, Mass. (Junior, 1947).
Bean, E. L., 50 Portland Ave., Dover, N. H. (Junior, 1948).
Blenis, H. W., Maritime Forest Ranger School, Fredericton, N. B., Canada. (Junior, 1948).
Crosby, D., 335 Prospect St., New Haven, Conn. (Junior, 1947).
Day, G. M., Contoocook, N. H. (Junior, 1947).
Dillon, F. H., 211 Cameron Dr., Dundalk, Md. (Junior, 1947).
Duda, E. J., 272 East St., Easthampton, Mass. (Junior, 1948).
Ehelebe, C. F., 205 Prospect St., New Haven, Conn. (Junior, 1948).
Foulds, R. T., 19 West Road, Burlington, Vt. (Junior, 1948).
Hale, R. A., 219 Main St., Lisbon Falls, Maine. (Junior, 1948).
Hall, S. G., 8 Garland St., Plymouth, N. H. (Junior, 1948).
Hart, I. A., Star Route, New Hartford, Conn. (Junior, 1948).
Hayes, W. D., Box 864, Bangor, Maine. (Junior, 1922).
Hilton, C. W., Norridgewock, Maine. (Junior, 1944).
MacConnell, W. P., 51 Cottage St., Amherst, Mass. (Junior, 1948).
Mackay, M., Box 669, St. John, N. B., Canada. (Junior, 1948).
McCamey, B. F., Separatist Road, Storrs, Conn. (Junior, 1947).
McChesney, E. M., Consulting Forester, 57 N. Y. Street, Bangor, Maine; State Univ. of N. Y., B.S.F., 1936. Reinstatement.
Monk, B. E., 131 Washington St., Penacook, N. H. (Junior, 1948).
Moore, E. L., 26 Green St., Houlton, Maine. (Junior, 1947).
Morton, P., Guilford, Maine. (Junior, 34R-42R49).

Forest Science

A Quarterly Journal of Forestry Research

You are invited to become a charter subscriber to FOREST SCIENCE, the new quarterly journal of forestry research which will make its appearance about March 1955. Subscription price $6—foreign postage 50 cents, Canadian 25 cents.

FOREST SCIENCE is being published with the cooperation of the Society of American Foresters and forest research and educational organizations generally. Its editorial board is composed of Henry Clepper, executive secretary of the Society of American Foresters; V. L. Harper, assistant chief (forest research), Forest Service, U.S. Department of Agriculture; and Stephen H. Spurr, professor of silviculture, University of Michigan, *Chairman*. It is designed to bring together in a single journal of international circulation papers of interest to research workers, teachers, and administrators and will supplement, rather than compete with, the *Journal of Forestry*.

Subscribe now to FOREST SCIENCE.

Society of American Foresters
Mills Building
Washington 6, D. C.

DON'T BREAK YOUR NECK! PREVENT ACCIDENTS!

Prune the Tallest Tree While Standing Safely on the Ground

CUT LABOR COSTS 50% DOUBLE PRODUCTION! With the New, Amazing, **LIGHTWEIGHT ALUMINUM** Comb. Sawing, Pruning, Trimming, Fruit Picking, Shaking Poles.

AVOCADO
PEAR, PEACH & APPLE PICKER
Fruit Picker No. 6
Curved Type Tree Saw No. 11
Hook No. 5
Block & Tackle Trimmer No. 7
Tree Saw No. 9
SECTIONAL POLES
1/3 WT. OF WOODEN POLES

Combine sections of Poles to make Poles up to 90 ft. tall. Weighs 1 lb. per 5 ft. 70c per ft. Attachments extra. No breakage. No splinters. Lasts forever. Send for FREE CATALOG & FREE BOOKLET HOW TO PRUNE FRUIT & SHADE TREES

J. Jacobsen CORP.
300-S. Los Angeles St.
Los Angeles 13, Calif. - MA. 6-9397

Nienstaedt, H., Box 1106, New Haven, Conn. (Junior, 1948).
O'Brien, O. O., 24 MacKenzie Ave., Lincoln, Maine. (Junior, 1948).
Pingree, A. V., Auden, Ont. Canada. (Junior, 1947).
Porter, E., 59 Manrese, Quebec, P. Q., Canada. (Junior, 1948).
Reed, C. G., 48 Somerset Ave., Pittsfield, Maine. (Junior, 1948).
Renoux, J. F., 16 Brooks St., South Paris, Maine. (Junior, 1948).
Richards, T., Hurricane Farm, Keene, N. H. (Junior, 1948).
Savage, E. T., 29 Grove St., Bangor, Maine. (Junior, 22R52).
Tosi, J. A., Inter-American Inst. of Agric. Sciences, Lima, Peru. (Junior, 1948).
Wilson, R. W., N. E. Forest Expt. Sta., Laconia, N. H. (Junior, 1947).
Winter, G. H., 6 Thomas St., Bucksport, Maine. (Junior, 1944).
Wood, R. W., Church Hill Rd., Woodstock, Vt. (Junior, 1946).
Woodward, K. W., Center Sandwich, N. H. (Junior, 1948).
Young, C. C., 81 Sixth St., Old Town, Maine. (Junior, 1948).

Associate Grade

Hemenway, J. T., Sec. Treas., N. E. Forestry Foundation, Inc., Boston, Mass.

New York Section

Student Grade

STATE UNIVERSITY OF NEW YORK

Adams, R. E. — Leuschner, W. A.
Balon, E. J. — O'Keefe, C. T.
Edwards, W. J. — Scherer, W. D.
Knight, C. B. — Talerico, R. L.

Junior Grade

Olcott, F. W., Forester, N. Y. State Cons. Dept., Ticonderoga, N. Y.; State Univ. of N. Y., B.S.F., 1946. Reinstatement.

Member Grade

Caldwell, D. H., Instructor, N. Y. State College of Forestry, Canastota, N. Y. (Junior, 1948).
Fedkiw, J., Instructor, State Univ. of N. Y., Syracuse, N. Y. (Junior, 1948).
Hensel, J. S., Instructor, N. Y. S. Ranger School, Wanakena, N. Y. (Junior, 1948).
Hopkins, F. S., State Univ. of N. Y., Syracuse, N. Y. (Junior, 1947).
Lemon, P. C., Asso. Prof., State College for Teachers, Albany, N. Y. (Junior, 1947).
Lum, D. P., Lanpher St., Lowville, N. Y. (Junior, 1948).
Martinelli, M., 143 Winchell Rd., Syracuse, N. Y. (Junior, 1948).
Morrow, R. R., R. D. 1, Newfield, N. Y. (Junior, 1948).
Simeone, J. B., Instructor, State Univ. of N. Y., Syracuse, N. Y. (Junior, 1948).
Skaar, C., Instructor, State Univ. of N. Y., Syracuse, N. Y. (Junior, 1947).
Taormina, A. S., R. D. 5, Canandaigua, N. Y. (Junior, 1948).
Trach, J., Purling, N. Y. (Junior, 1948).

Associate Grade

Foster, E. E., Head of Agric. Div., N. Y. State Agric. & Tech. Inst., Alfred, N. Y.; Cornell Univ., B.S., (Agric.), 1929.

Northern California Section

Student Grade

UNIVERSITY OF CALIFORNIA

Atkinson, W. A. — Haight, H. H.
Biddison, D. L. — Ingco, G.
Clabaugh, R. W. — Meyer, D. S.
Cox, J. E. — Sanquinetti, D. J.
Dealey, D. S. — Winton, L. L.

Junior Grade

Hornibrook, E. M., Forester, U.S.F.S., Berkeley, Calif.; Ore. State, B.S.F., 1949.

Member Grade

Adams, S. D., Box 116, Yosemite Natl. Park, Calif. (Junior, 1948).
Albertus, C. G., Asst. Deputy State Forester, Calif. Div. of Forestry, Monterey, Calif. (Junior, 1948).
Andree, R. C., 1829 Yuba Street, Redding, Calif. (Junior, 1948).
Bangsberg, R. C., Fire Control Officer, Shasta Trinity Natl. Forest, Redding, Calif. (Junior, 1948).
Beard, B., Milford, Calif. (Junior, 1948).
Burrill, W. S., Area Control Man, U.S.F.S., Oakland, Calif. (Junior, 1948)
Byrne, J. J., Asst. Regional Forester, U.S.F.S., San Francisco, Calif. (Junior, 1948).
Cox, P. Forest Tech., Calif. Div. of Forestry, Redd...g, Calif. (Junior, 1948).
Dowdakin, J. C., Forest Tech., Calif. Div. of Forestry, Carmel, Calif. (Junior, 1948).
Fairbank, W. H., Deputy State Forester, Calif. Div. of Forestry, Sacramento, Calif. (Junior, 1948).
Finster, W. C., Tbr. Appraiser, Calif. State Board of Equalization, Sacramento, Calif. (Junior, 1947).
Fox, W. A., Forest Aide, U.S.F.S., Downieville, Calif. (Junior, 1947).
Haan, L. E., Dist. Ranger, U.S.F.S., Pasketa, Calif. (Junior, 1948).
Hastings, J. H., State Forest Ranger, Calif. Div. of Forestry, Sacramento, Calif. (Junior, 1948).
Hirschenberger, P. M., Forester, U.S.F.S., Milford, Calif. (Junior, 1947).
Hodges, R. D., Forest Eng., Western Pine Assoc., Sacramento, Calif. (Junior, 1948).
Johnson, C. E., Chief Ranger, U.S.F.S., Three Rivers, Calif. (Junior, 1948).
Johnston, R. R., Forester, Cheney Lbr. Co., Berkeley, Calif. (Junior, 1948).
Kuphaldt, W. H., Forester, Blagen Lbr. Co., White Pines, Calif. (Junior, 1948).
Lang, R. E., Dist. Ranger, U.S.F.S., Challenge, Calif. (Junior, 1948).
Loomis, E. W., Forester, Dolly Varden Lbr. Co., Arcata, Calif. (Junior, 1948).
Maclean, R. M., Forest Tech., Calif. Div. of Forestry, Fortuna, Calif. (Junior, 1948).
Metcalf, C. E., Deputy State Forester, Calif. Div of Forestry, Fresno, Calif. (Junior, 1948).
Moore, H. E., State Forest Ranger, Calif. Div. of Forestry, Sonora, Calif. (Junior, 1948).
Murray, J. H., Asst. Ranger, U.S.F.S., Greenville, Calif. (Junior, 1948).
Rueger, A. E., Forester, Dolly Varden Lbr. Co., Arcata, Calif. (Junior, 1948).
Scherer, H. H., Dist. Ranger, U.S.F.S., Happy Camp, Calif. (Junior, 1948).
Shively, P. E., Forester, Fiberboard Products Inc., Santa Rosa, Calif. (Junior, 1948).
Simpson, V. J., Forester, Shasta Forest Co., Westwood-Lassen Co, Calif. (Junior, 1948).
Solinsky, D., Private Forestry Consultant, Ross, Calif. (Junior, 1948).
Thompson, R. N., Dist. Ranger, U.S.F.S., Camptonville, Calif. (Junior, 1948).

— SENSATIONAL —

NEW MECHANICAL TREE GIRDLER

CUTS LABOR COSTS UP TO 50%

PRACTICAL - ECONOMICAL - EFFICIENT

LITTLE BEAVER . . . . The Machine Designed Especially For Tree Girdling

$179.95 each — FOB Jackson, Miss.

IMMEDIATE DELIVERY FROM OUR LARGE STOCKS

JOIN THE THOUSANDS WHO DEPEND UPON US FOR THEIR EVERY FORESTRY NEED

- Increment Borers
- Tree Diameter Tapes
- Log Scaling Rules
- Tree Marking Paint
- Cruiser Sticks
- Compasses
- Snake Bite Kits
- Tally Meters
- Tree Marking Devices
- Surveyor's Instruments
- Fire Suppression Equipment
- Mapping Accessories

FORESTRY SUPPLIERS, INC.

Box 8096 Jackson, Miss.

No. 3 of a series featuring state forestry practices, projects and products . . .

Arkansas

60% forest—wood processing is its No. 1 industry

Since 1826, when Arkansas' first steam-driven sawmill was founded at Helena, Arkansas has harvested more timber than was standing when lumbering began. More than a billion board feet have been produced each year since 1900. Wood-processing industries are the backbone of the state's industrial economy. More than 1600 mills and factories, ranging from small sawmills to multi-million dollar pulp and paper board plants, —employ Arkansas' largest labor force.

Maintaining 60% woodlands in the face of this terrific output is no mean feat. In 1942, Arkansas became the nation's third tree farming state and today its total number of tree farms ranks 6th; its tree farm acreage, 3rd. This program is sponsored by the Arkansas Division of Forestry, assisted by the Southern Pine Association. The Arkansas State Nursery at Bluff City makes seedlings available to farmers and to forest industries, encouraging their planting of all abandoned farm land and understocked areas. With more than ¾ of its forest area under protection, Arkansas boasts one of the finest fire-protection records in the South.

ARKANSAS DIVISION OF FORESTRY *and American Forest Products Industries, Inc.—contribution to this series does not necessarily constitute endorsement of Southern Glo products.*

SOUTHERN GLO Paste offers the forester the ultimate in tree-marking economy. Low in initial cost, it mixes with thinner in proportions that produce more actual paint per paste gallon. If you use paste, investigate SOUTHERN GLO today. Bright (Seeing) Red, orange, yellow, blue, white, aluminum.

SOUTHERN COATINGS AND CHEMICAL COMPANY, Dept. 2, Sumter, S. C.

Todd, D. F., Box 401, Chester, Calif. (Junior, 1948).
Wagener, C. L., Asso. State Forest Ranger, Calif. Div. of Forestry, Camino, Calif. (Junior, 1948).
Wallen, A. F., Private Consulting Forester, 1209 8th Ave., Oakland, Calif. (Junior, 1948).
Weddle, A. J., Forester, U.S.F.S., Canby, Calif. (Junior, 1947).
Woolfolk, J., Dist. Ranger, Lassen Natl. Forest, Hat Creek, Calif. (Junior, 1948).
Wooltee, A. L., Dist. Ranger, U.S.F.S., Porterville, Calif. (Junior, 1948)

Associate Grade

Gardner, R. A., Project Forester, U.S.F.S., Berkeley, Calif.; Univ. of Calif., B.S., (Soil Science), 1936; M.S., 1939.

Northern Rocky Mountain Section

Student Grade

MONTANA STATE UNIVERSITY

Christman, P. D. — Kelley, A. F.
Crozer, E. A. — Larkin, D. H.
DeBruine, G. R. — Rogers, R. L.
Estey, W. R. — Smith, Z. G.
Holden, J. D. — Wanner, K. A.

Member Grade

Arnold, D. L., Dist. Ranger, U.S.F.S., Kalispell, Mont. (Junior, 1948).
Bailey, F. T., Dist. Ranger, U.S.F.S., West Yellowstone, Mont. (Junior, 1948).
Hamre, V. O., Dist. Ranger, U.S.F.S., Sula, Mont. (Junior, 1948).
Mahrt, G. A., Asst. Supv., U.S.F.S., Great Falls, Mont. (Junior, 1947).

BELSAW ... Over 30 Years in the Development and Manufacture of PORTABLE SAWMILL EQUIPMENT

Thousands of Belsaw Portable Saw mill users throughout the world . .

Belsaw goes right to the trees, thus getting more lumber from all the cut timber. For low cost, high quality production the Belsaw line leads the field. Write today for Free Book "How To Make Lumber."

BELSAW MACHINERY CO
8914 Field Building, Kansas City 11, Missouri

SILVA COMPASS
Simpler — More Accurate

Recommended by foresters for cruising. Easier to use, faster, positive. Direct course readings. *Write for free literature and instructions.*

SILVA, INC., Dept. J, LaPorte, Ind. RANGER MODEL

BAKED ENAMEL
METAL FORESTRY SIGNS
for WOODLAND BOUNDARY MARKERS — NO TRESPASSING & FIRE WARNING SIGNS — CRUISER TAGS, etc., etc., made to your specifications. Write for quotations on all your sign needs.
A. L. LIND COMPANY
3636 Thomas Ave. So.
Minneapolis 10, Minnesota

GROW TREES
FOR XMAS TREES AND FORESTRY
Fir, Pine and Spruce in Variety
Seedlings and Transplants
Write for Price List
Suncrest Evergreen Nurseries
P. O. Box 643, Johnstown, Pa.

TREES & SHRUBS
Raise your own trees and shrubs from SEEDS. Beautiful Evergreens, lovely trees and shrubs for shade, windbreak, snow fence, erosion control, ornament, etc. For FREE planting guide and price list write
WOODLOT SEED CO., Norway 44, Mich.

Milodragovich, R. R., Dist. Ranger, U.S.F.S., Lima, Mont. (Junior, 1948).

Ozark Section

Junior Grade

Chancey, T. S., Asst. Forester, Dierks Forests Inc., Benton, Ark.; Univ. of Calif., B.S.F., 1949. Reinstatement.
Collins, J. M., Forester, International Paper Co., Sheridan, Ark.; Univ. of Fla., B.S.F., 1950.
Wallace, D. R., Marketing Forester, Univ. of Ark., Little Rock, Ark.; L.S.U., B.S.F., 1952.

Affiliate Grade

Benning, C. W., Field Asst., International Paper Co., Sheridan, Ark.
Bowers, J. W., Forest Tech., International Paper Co., Sheridan, Ark.; Okla. A&M, B.S., (Forestry), 1952.
Peace, B. O., Field Asst., International Paper Co., Sheridan, Ark.
Reese, E. A., Forester, International Paper Co., Sheridan, Ark.

Puget Sound Section

Student Grade

UNIVERSITY OF WASHINGTON

Chatfield, D. E. — Scheuch, B. C.
Kellie, W. N. — Welsh, R. H.
Myers, J. L.

Junior Grade

Christy, W. H., Contract Logging Supv., Crown Zellerbach Corp., Naselle, Wash.; Oregon State, B.S.F., 1942. Reinstatement.

Member Grade

Allen, J. W., Forester, Bloedal Tbr. Co., Bellevue, Wash. (Junior, 1948).
Bryan, W. D., Forester, U.S.F.S., Shelton, Wash. (Junior, 1948).
Bryant, B. S., 8015 Sunnyside Ave., Seattle, Wash. (Junior, 1948).
Chouinard, M. B., Forester, Weyerhaeuser Tbr. Co., Oakville, Wash. (Junior, 1948).
Ely, R. K., Box 11, Neah Bay, Wash. (Junior, 1948).
Emerson, J. L., Operations Officer, U.S.F.S., Juneau, Alaska. (Junior, 29R53).
Fensom, K. G., Forest Products Lab., Univ. of B. C., Vancouver, B. C., Canada. (Junior, 1948).
Harrison, F. L., Logging Engr., Rayonier, Inc., Forks, Wash. (Junior, 1948).
Kirkwood, C. C., Forester, National Plywood Co., Forks, Wash. (Junior, 1948).
Lahti, G. E., 6216 17th N.W., Seattle, Wash. (Junior, 1948).
Lonngren, G. V., 207 N. Michigan St., Aberdeen, Wash. (Junior, 1946).
Opdahl, A., Crown-Zellerbach Corp., Port Angeles, Wash. (Junior, 1948).
Schultz, R. D., Schultz Tbr. 120, Vancouver, B. C., Canada. (Junior, 1948).
Stubb, D., 507 W. Bel Aire Ave., Aberdeen, Wash. (Junior, 1948).
Vincent, W. L., Forester, Rayonier, Inc., Aberdeen, Wash. (Junior, 1947).
Walmsley, C. E., Rt. 3, Box 97A, Shelton, Wash. (Junior, 1948).

Southeastern Section

Student Grade

UNIVERSITY OF FLORIDA

Baxley, W. R. — Hausman, D. W.

UNIVERSITY OF GEORGIA

Allen, G. J. — Preston, D. N.
Mills, R. T. — Weaver, R. F.

Junior Grade

Flowers, E. D., Forester, Union Bag & Paper Corp., Folkston, Ga.; N. C. State, B.S.F., 1954.
Reines, M., Geneticist, Univ. of Ga., Athens, Ga.; Pa. State, B.S.F., 1942; M.S., (Botany), 1952; Ph.D., (Botany), 1952. Reinstatement.
Welch, M. J., Jr. Forester, Union Bag & Paper Corp., Homerville, Ga.; Univ. of Fla., B.S.F., 1953.

Member Grade

Bethea, J. M., Chief Fire Control, Fla. Forest Service, Tallahassee, Fla. (Junior, 1948).
Byrd, R. E., Asst. Project Mgr., Atlantic Land & Improvement Co., LaBelle, Fla. (Junior, 1948).
Connell T. E., Forester, Langdale Co., Valdosta, Ga. (Junior, 1948).
Evans, R. R., Forester, Brunswick Pulp & Paper Co., Brunswick, Ga. (Junior, 1948).
Fassnacht, D. L., Forester, Southern Forest Expt. Sta., New Orleans, La. (Junior, 36R50R52).
Gaztambide, J. B., Director, Grad. School, Univ. of Puerto Rico, Rio Piedras, Puerto Rico. (Junior, 1947).
Harper, R. A., Asst. Dist. Ranger, U.S.F.S., Wilma, Fla. (Junior, 1948).
Haynes, W. N., Dist Forester, Union Bag & Paper Corp., Waycross, Ga. (Junior, 1948).
Hebb, E. A., Research Forester, Southern Forest Expt. Sta., Marianna, Fla. (Junior, 1948).
Huffman, J. B., Prof., Univ. of Fla., Gainesville, Fla. (Junior, 1948).
Jensen, A. S., Ext. Forester, Univ. of Fla., Gainesville, Fla. (Junior, 1948).
Langdon, O. G., Research Forester, Southeastern Forest Expt. Sta., Fort Myers, Fla. (Junior, 1948).
Miller, W. W., Asst. Mgr., Natl. Turpentine & Pulpwood Corp., Jacksonville, Fla. (Junior, 1948).
Pond, R. B., Tbr. Appraiser, Equitable Ins. Co., Preston, Ga. (Junior, 1948).
Reinert, G. L., Farm Forester, Fla. Forest Service, Lake City, Fla. (Junior, 1948).
Stallworth, N. B., Forester, Stallworth Naval Stores Co., Vinegar Bend, Ala. (Junior, 1948).
Thrash, F. W., Forester, Union Bag & Paper Co., Savannah, Ga. (Junior, 1948).
Turner, J. C., Dist. Forester, Ga. Forestry Comm., Washington, Ga. (Junior, 1948).
Walker, L. C., Asst. Prof., Univ. of Ga., Athens, Ga. (Junior, 1948).
Watson, W. J., Ala. Div. of Forestry, Montgomery, Ala. (Junior, 1948).
Wesley, G. H., Vice Pres., Natl. Turpentine & Pulpwood Co., Jacksonville, Fla. (Junior, 1948).
West, E., Dist. Forester, Buckeye Cellulose Corp., Foley, Fla. (Junior, 1948).

Affiliate Grade

Thomas, A. L., Forest Engr., International Paper Co., Panama City, Fla.

Southern California Section

Junior Grade

Britton, L. R., Dist. Ranger, U.S.F.S., Descanso, Calif.; Univ. of Calif., B.S.F., 1948. Reinstatement.

Member Grade

Rice, N. B., 4494 Kansas Ave., Riverside, Calif. (Junior, 1948).

Southwestern Section

Member Grade

Andrews, S. R., Forest Path., Rky. Mtn. Forest & Rge. Expt. Sta., Albuquerque, N. Mex. (Junior, 35R54).
Hansen, W. L., 1116 Montclaire Dr., N.E., Albuquerque, N. Mex. (Junior, 37R53).
Hodgin, F. M., Forest Supv., U.S.F.S., Albuquerque, N. Mex. (Junior, 34R52).
Lindenmuth, A. W., Forest Fire Research, Rky. Mtn. Forest & Rge. Expt. Sta., Albuquerque, N. Mex. (Junior, 1945)
McClure, O. L., Dist. Ranger, U.S.F.S., Paulden, Ariz. (Junior, 1948).
Qualls, C. P., Dist. Ranger, U.S.F.S., Payson, Ariz. (Junior, 1948).
St. John, C. P., Dist Ranger, U.S.F.S., Coyote, N. Mex. (Junior, 1948).
Snyder, N. Dist. Ranger, U.S.F.S., James Springs, N. Mex. (Junior, 1948).
Sontag, H. O., Asst. Ranger, U.S.F.S., Gallup, N. Mex. (Junior, 1948).
Starkey, B. H., Dist Ranger, U.S.F.S., Magdalena, N. Mex. (Junior, 1948).
Van Gilst, G. W., Dist. Ranger, U.S.F.S., Membres, N. Mex. (Junior, 1948).

Upper Mississippi Valley Section

Student Grade

IOWA STATE COLLEGE

Prestemon, D. R.

UNIVERSITY OF MINNESOTA

Anderson, K. N. — Myhre, D. W.

Junior Grade

Christensen, M. C., Forester, U.S.F.S., Remer, Minn.; Mich. State, B.S.F., 1932, Reinstatement.
Conrad, N. H., Asst. Dist. Ranger, U.S.F.S., Deer River, Minn.; Univ. of Minn., B.S.F., 1940. Reinstatement.

Member Grade

Dolence, F. L., 2914 5th Ave., Hibbing, Minn. (Junior, 1934).
Drooz, A. T., Div. Forest Insect Res., Lake States Forest Expt. Sta., St. Paul, Minn. (Junior, 1948).
Ennis, A. F., Asst. Forester, Minn. & Ont. Paper Co., Big Falls, Minn. (Junior, 1948).
Kirkvold, J. M., Area Supv., Minn. Forest Service, Cambridge, Minn. (Junior, 1948).
Krajicek, J. E., Research Forester, U.S.F.S., Amana, Iowa. (Junior, 1947).
Leaf, W. F., Tbr. Mgmt., U. S. Indian Service, Cass Lake, Minn. (Junior, 1948).
Marden, R. M., 134 Downs Ave., St. Paul, Minn. (Junior, 1948).
Olson, H. S., Wood Purchaser, Wood Conversion Co., Cloquet, Minn. (Junior, 1948).
Powell, T. R., Coordinator, North Star Tbr. Co., Duluth, Minn. (Junior, 1948).
Whiting, C. H., Area Supv., Minn. Forest Service, Brainerd, Minn. (Junior, 1948).
Wright, W. D., Ranger, U.S.F.S., Remer, Minn. (Junior, 1948).
Yoho, J. G., Asst. Prof., Iowa State, Ames, Iowa. (Junior, 1948).

Affiliate Grade

Trygg, P., Timber Cruiser, Diamond Match Co., Cook, Minn.

Wisconsin-Michigan Section

Student Grade

MICHIGAN STATE COLLEGE

Hittenrauch, H. R. Rodgers, G. W.

Junior Grade

Cancell, B. R., President, Rhinelander Paper Co., Rhinelander, Wis.; Univ. of Mich., B.S.F., 1937; M.S., 1938. Reinstatement.

Maksymiuk, B., Tbr. Mgmt. Aide, U.S.F.S., Ann Arbor, Mich.; Univ. of Mich., B.S.F., 1953.

Member Grade

Berklund, B. L., Forester, Nekoosa-Edwards Paper Co., Post Edwards, Wis. (Junior, 1948).

Boehm, E. W., Consulting Forester, 1206 6th Ave., Bay City, Mich. (Junior, 1948).

Bouis, C. E., 2246 Morton Ave., Muskegon, Mich. (Junior, 1948).

Griewe, R. J., Forester, Wm. Bonifas Lbr. Co., Marquette, Mich. (Junior, 1948).

Hakala, D. R., Park Ranger, Isle Royale Natl. Park, Houghton, Mich. (Junior, 1948).

Hall, E. C., Grand Sable State Forest, Shingleton, Mich. (Junior, 1948).

Hitt, R. G., Forester-in-charge, Forest Genetics Research, Univ. of Wis., Madison, Wis. (Junior, 1948).

Kimmel, J. M., Sales Mgr., Dant & Russell Sales Co., Milwaukee, Wis. (Junior, 1947).

Lemmien, W. A., Resident Forester, W. K. Kellogg Forest, Augusta, Mich. (Junior, 1948).

Martin R, Chief Forester, Goodman Lbr. Co., Goodman, Wis. (Junior, 1948)

Olmstead, R. L., Regional Supv., Cons. Headquarters, Lansing, Mich. (Junior, 1948).

Phillips, A. J., Dist. Forester, Mich. Dept. of Cons., Lapeer, Mich. (Junior, 1948).

Rouse, R. A., Dist. Forester, Wm. Bonifas Lbr. Co., Ironwood, Mich. (Junior, 1948).

Sperhake, N. G., Forester, Wm. Bonifas Lbr. Co., Marquette, Mich. (Junior, 1948).

Stephens, V., Dist. Ranger, U.S.F.S., Lakewood, Wis. (Junior, 36R50).

Thomas, P. B., Forester, Wm. Bonifas Lbr. Co., Iron Mountain, Mich. (Junior, 1948).

Wandrey, C. J., Forester, U.S.F.S., Black River Falls, Wis. (Junior, 1948).

Wolff, W., Forester, U.S.F.S., Long Lake, Wis. (Junior, 1948).

Consulting Foresters

Professional Services Offered by

Members of the Society of American Foresters

schultz — DESIGNERS · ENGINEERS · MANAGERS · SURVEYORS · FORESTERS · APPRAISERS

C. D. SCHULTZ & COMPANY
Limited
Vancouver, Canada Seattle, Wash., USA

KEITH CRANSTON, Consultant
Leland, Mississippi
(Headquarters)
A Southwide Professional Service

GEORGE BANZHAF & COMPANY
622 North Water Street MILWAUKEE 2 BRoadway 6-2068
Consultants to the Forest Industries

ALBERT G. HALL
Forestry Relations Counsel
Consulting Forester
1740 K Street, N.W., Washington 6, D. C.

WILLIAM J. BOZETT
Consulting Forester
Serving Landowners—Industry
Ohio, Adjoining States.
FOREST MANAGEMENT, MARKETING
681 EAST FRONT ST. LOGAN, OHIO

POND & MOYER CO., INC.
Consulting Foresters
Estimates—Appraisals—Surveys
Machine Tree Planting Service
107 HOMESTEAD RD., ITHACA, N. Y.

Reforestation Arboriculture
S. GAYLEY ATKINSON
Consulting Forester
Huntingdon Road
Huntingdon Valley, Pa.

FOREST PROPERTY
Estimates—Appraisals—Management
Prentiss & Carlisle Co., Inc.
107 Court Street Bangor, Maine

WILLIAM A. EASTMAN, JR.
Consulting Forester
Complete Professional Service
SEATTLE 1, WASHINGTON
410 J. GREEN BUILDING
Phone SEneca 2814

T. M. HOWERTON, JR.
Forestry Consultant
Service Available in the Southeast
Member, Association of Consulting Foresters
MADISON, FLORIDA

FOREST APPRAISALS FOREST TAXATION
GROWTH AND MANAGEMENT PLANS
FRANK J. LEMIEUX
Consulting Forester
25 Years' Experience in North and South America
833 WHITNEY BLDG., NEW ORLEANS 12, LA.

H. PRICE
ANAGEMENT
ilizing in
Tax Problems
—Seattle 99, Wash.
der 7482

TIMBERLAND MANAGEMENT, INVENTORY AND APPRAISAL
OVER 50 MILLION ACRES SINCE 1910
JAMES W. SEWALL COMPANY
FOREST ENGINEERS
OLD TOWN, MAINE
BRANCH: JAMES W. SEWALL CO. (CANADA) LTD., FREDERICTON, NEW BRUNSWICK

Save Your Trees from Old Man Winter

Damage by ice and wind often can be avoided, or the effects lessened by use of correctly designed pruning tools, bracing materials, and tree wound dressing.

POLE TREE TRIMMERS No. LR—(compound lever, easy cutting) 6 ft. pole. Other lengths up to 16 ft.

POLE SAW No. 44—(curve saw cuts freely) 8 ft. Other lengths.

TREE FEEDING

made easy with **No. 98 EARTH AUGER**, 2" diam. 40" overall. High grade steel heat treated.

Write today for your free copy of catalog No. 31, showing complete line.

BARTLETT MFG. CO.
3015 E. Grand Blvd.
DETROIT, MICHIGAN

For over ten years
a dependable source
for
Southern Pine Seed
SOUTHERN SEED COMPANY INC.
Baldwin, Georgia

FOREST SEEDS
of CALIFORNIA
Since 1952
R. S. ADAMS A. P. BAAL
553 CAMPUS WAY
DAVIS ——— CALIFORNIA

Forestry News

PRESIDENT EISENHOWER greeted by Chief of the U. S. Forest Service, Richard E. McArdle, *left*, and Montana Governor J. Hugo Aaronson at the dedication of the Forest Service's new aerial fire depot at Missoula.

President Eisenhower Dedicates New Forest Service Aerial Fire Depot

Conservation will have the support of the federal government as long as he is connected with it, President Eisenhower told a crowd of 30,000 people at the dedication of the Forest Service's new aerial fire depot at Missoula, Mont., September 22.

Many in the crowd expected the President's speech to kick off the fall election campaign, but Mr. Eisenhower devoted his talk to praising the work of the smokejumpers who will be housed in the new depot. He said he first heard of the smokejumpers while he was still in the army, and the Forest Service helped train the parachute units of the armed forces. He remarked that he had long wanted to "join in a salute to the Forest Service, particularly the smokejumpers," because they have saved priceless assets of the nation.

Prior to the President's speech, Chief Forester Richard E. McArdle spoke briefly on the history of the smokejumper project. He said "We don't use smokejumpers because it is a spectacular way to put out fires. In many cases it is the cheapest and most efficient method, and sometimes it is the only way to put out fires in remote country. The method more than pays its way in saving priceless watershed, timber and jobs besides the scenic and other recreational values of the forests."

Concluding the ceremony, Fred Brauer, smokejumper foreman, presented President Eisenhower with a scroll making him an honorary member of the smokejumpers. The President was also given a white inscribed smokejumper helmet and three Smokey Bear T-shirts for his grandchildren.

The new aerial fire depot, as its name implies, centralizes all the aerial fire fighting equipment and personnel associated with operations in the Mon-

tana and north Idaho areas. There is a dormitory for the smokejumpers, a residence for their foreman, a storage loft for the parachutes, an airplane hangar, a training area, and a warehouse which contains firefighting equipment for 5,000 men.

The President on landing at the aerial depot was greeted by the guests of honor, including: Governor J. Hugo Aaronson; Chief Forester McArdle; Representative Wesley A. D'Ewart, who acted as master of ceremonies; Mrs. Maggie Smith Hathaway of Helena, one of the first two women ever elected to the Montana legislature; James Sullivan, administrative assistant to Senator Mike Mansfield; State Foresters Gareth Moon of Montana, Mike Webster of Washington, and Roger Guernsey of Idaho; P. D. Hanson, regional forester for the Forest Service's Northern Region; Chet Olson, regional forester for the Intermountain Region; and Reed Bailey, director of the Intermountain Forest and Range Experiment Station.

Clayton Crocker, assistant regional forester for the Northern Region, and H. C. Jensen, manager of the Florence Hotel in Missoula, were co-chairmen of the dedication program.

Two S.A.F. Past-Presidents Become Consultants

Clyde S. Martin and George L. Drake, both past-presidents of the Society, have hung out their shingles in Tacoma, Wash., as forest consultants.

The two men will share office space but will work independently except on specific jobs where combined efforts are needed. Mr. Martin has announced that they each hope to work "on most of the problems confronting industrial forestry but not to compete with existing consultants in cruising, timber brokerage, or other strictly forest engineering work."

Mr. Drake retired the past spring from the position of vice president of the Simpson Logging Company, Shelton, Wash. Mr. Martin retired October 1 as forestry counsel with the Weyerhaeuser Timber Company.

Audrey Warren's Career Publicized by Monitor

The Society's business manager, Miss L. Audrey Warren, was the subject of a special article in the "Women Today" section of the October 27 issue of *The Christian Science Monitor*. This world renown newspaper was impressed, as have been many members of the Society, with the fact that "she has hewn a career for herself in a man's world—among foresters."

The article tells of Miss Warren's work with the Society since 1928, including organizational and business matters as well as her efforts on behalf of the JOURNAL OF FORESTRY and in furthering the status of the forestry profession.

N.L.M.A. Holds Annual Meeting

Directors of the National Lumber Manufacturers Association climaxed their 1954 annual meeting, November 8-10 in Washington, D. C., by electing Judd Greenman, Vernonia, Ore., as N.L.M.A. president for 1955 and voting to expand the association's public relations program.

The directors also enlarged the association's Forest Policy Statement by calling for an end to the "concept of federally created and financed valley authorities." The resolution declared that state and local governments have a responsibility to solve their own water resources problems.

In other resolutions, the association: (1) Called for readjustments in federal payments to compensate state and local governments for taxes lost on federal lands. N.L.M.A. said this was needed because extensive federal land ownership has created inequitable tax burdens on private lands. (2) Urged lumbermen to continue to grow "successive crops" of timber, meanwhile expanding the use of private forest land for hunting and fishing wherever possible. (3) Changed the name of N.L.M.A.'s Forest Conservation Committee to the Forest Management Committee.

As N.L.M.A. president for 1955, Greenman succeeds James R. Bemis, Prescott, Ark. Bemis was elected chairman of the board of directors, succeeding Ralph R. Macartney, Klamath Falls, Ore., who was elected a director-at-large.

Greenman, a native of Kansas City, Kans., is general manager of the Vernonia Division of the Long-Bell Lumber Co. He served as first vice president of N.L.M.A. during the past 12 months. Bemis, president of the Ozan Lumber Co., is a former president of the Southern Pine Association.

L. D. Kellogg, president of the L. D. Kellogg Lumber Co., Inc., Alexandria, La., was elected first vice president of N.L.M.A., succeeding Greenman. A native of Appalonia, Wisc., Kellogg is vice president of the Southern Hardwood Producers, Inc.

K+E

FROM EVERY ANGLE

Traditional K&E care and precision go into the making of these useful forestry instruments . . . K&E Right Angle Instruments and The K&E Hand Level with a right angle feature.

These instruments are *rugged* . . . designed to stand up without the need of constant adjusting even under the rough usage of forest work.

THE RIGHT ANGLE PRISM

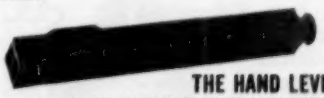
This compact instrument consists of a single ground triangular prism and it, therefore, cannot get out of adjustment. A plumb bob can be attached to the hook of the handle.

THE RIGHT ANGLE MIRROR

This instrument gives a slightly larger field of view and is adjustable. As an added feature, a small plumb bob is conveniently stowed in the handle.

THE DOUBLE RIGHT ANGLE PRISM

Consisting of two ground pentaprisms separated by a plano-parallel element, it can be *placed on a line between two points* and a third point at right angles can be sighted. A plumb bob can be attached or the instrument can be mounted on a staff.



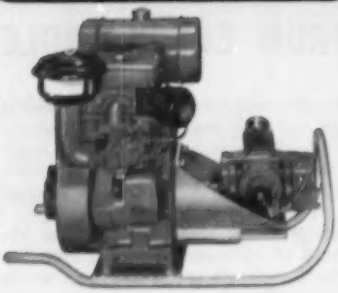
THE HAND LEVEL WITH A RIGHT ANGLE FEATURE

Here is a dual-purpose instrument with all of K&E's famed precision. While its principal use is as a hand level, it offers the right angle feature as well. Note the flat base permitting use on a level board.

Ask any K&E Distributor or Branch for further information or write Keuffel & Esser Co., Hoboken, N. J.

KEUFFEL & ESSER CO.
EST. 1867
Drafting, Reproduction, Surveying Equipment and Materials, Slide Rules, Measuring Tapes.
New York • Hoboken, N. J.
Detroit • Chicago • St. Louis
San Francisco • Los Angeles • Montreal

PACIFIC PUMPERS
famous for power
plus portability



The WX-10 is a heavy duty general utility pumper built for the toughest service conditions. The 7½ hp engine puts out exceptionally good volume and pressure . . . up to 32 gallons per minute at 250 lbs. pressure.

With "sled-type" mounting and weighing only 150 lbs., the WX-10 has the portability and maneuverability of a much smaller pumper . . . even in rough terrain. Equipped with electric starter the WX-10 is ideal for tanker use and other semi-portable applications.

Dimensions:
Length 30" Width 21" Height 22"
Weight:
150 lbs. (with starter 170 lbs.)
Performance:

Pressure	50	100	150	200	225	250
Gallons per minute	40	38	37	36	35	32

PACIFIC "Pacolized" Hose is a made-to-order partner for all portable or emergency water supply equipment . . . the best lightweight hose you can buy. "Pacolized" Hose is permanently mildew-proof and rot-resistant, the most flexible hose of its type.

Specify "Pacific" when you buy pumpers, hose and accessories . . . write to "Pacific" for full information on the WX-10 and the full line of portable fire equipment.

PACIFIC Marine Supply Co.
FIRE EQUIPMENT DIVISION
SEATTLE 1, WASHINGTON

DEAN PAUL M. DUNN, (*right*) who resigned as head of the School of Forestry, Oregon State College, and who had served as Keep Oregon Green chairman for ten years, was presented with a brief case by Governor Paul Patterson on November 17 in Salem. The brief case is a farewell gift to Dean Dunn from the members of the board of trustees of Keep Oregon Green, of which Governor Patterson is president.

The three-day meeting was attended by about 200 lumber manufacturers and their wives—the second largest attendance in the association's 52-year history.

Principal speaker was Miss Elizabeth Gordon, editor of *House Beautiful*, who said the lumber industry must gear its thinking to new concepts in home design—concepts of "abundant living"—in order to increase its markets.

A special feature of the annual meeting was the premiere of a new color motion picture, "Engineered Timber Construction," released by the Timber Engineering Co., N.L.M.A.'s research affiliate. The movie is designed specifically for showing to architects, engineers and students.

Allied

National Wildlife Week to Stress Wetlands Values

In announcing plans for its major educational campaign of 1955, the National Wildlife Federation said its purpose was to "halt the drainage madness that threatens to destroy American waterfowl populations and other unique and irreplaceable resources."

National Wildlife Week has been sponsored annually for 17 years by the Federation and affiliated organizations in the various states. It was established in 1938 when by proclamation the late President Roosevelt called upon American citizens to apply special thought and effort to the problems of natural resource conservation. The 1955 dates will be March 20-26, encompassing, as usual, the first day of spring.

Although the Federation says the general purpose remains the same—to get more people thinking, talking and doing something about conservation—specific resource objectives have been emphasized in recent years. Last spring the theme was water pollution control. In 1952 and 1953 the nearly extinct Florida key deer and the endangered prairie chicken were singled out for special attention.

In a campaign that will reach a peak during the week of March 20-26, organized conservationists will stress the wildlife, recreational, esthetic, and water-supply values of the nation's remaining marshes, swamps, sloughs, bayous and upland lakes.

Southern Agricultural Workers To Discuss Hardwoods

A discussion on desirable and undesirable hardwoods will highlight a half-day session of the annual meeting of

the Forestry Section of the Association of Southern Agricultural Workers to be held in Louisville, Ky., on February 7, 8, and 9, 1955, according to C. B. Marlin of the Mississippi Forestry Commission, secretary of the Section.

The association is comprised of agricultural workers from 13 southern and southeastern states.

D. P. White Heads Soils Division, Agronomy Society

Professor Donald P. White of the State University of New York College of Forestry was named chairman of the Forest and Range Soils Division of the American Society of Agronomy at the Society's meeting in St. Paul, Minnesota, November 8-12, 1954.

During the past year Dr. White served as vice-chairman and program head of the division.

Soil Science Society Forms Forest and Range Division

The Soil Science Society of America now has a division devoted to the subject matter of forest and range soils. Technical advances in this field are reported quarterly in the Proceedings of the Society. The division prepares and publishes a bibliography of forest soils research with abstracts and citations. Part III containing 66 pages and covering the period 1950-1952 is available for $1 (to cover production and mailing costs) from John L. Retzer, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.

Private and Industrial

Dierks Takes New Name

Dierks Lumber & Coal Company, manufacturer of southern pine and hardwoods, has changed its corporate name to Dierks Forests, Inc. The new name was adopted to more accurately describe the company's current operations which involve the growing of timber and conversion into lumber and other forest products.

The present company is the development of a business which was started in 1880 as a retail lumber and coal yard at Walnut, Iowa. From this small beginning it expanded until at one time the Dierks' interests operated twenty retail yards. As the company expanded into the field of lumber manufacture, the retail business became a minor part of its operations.

Much of the timberlands of Dierks Forests, Inc. were acquired from other lumber companies which had cut over a major portion of their holdings and had no further use for the land. The lands are located primarily in southeastern Oklahoma and southwestern Arkansas. In 1914 the company inaugurated a program of fire prevention and control, and in 1921 set up a forestry department under experienced professional advisers.

Their current forestry program makes use of the services of 35 full-time foresters who manage the forestry operations. Radio-telephone equipment enables them to keep in constant touch with operations.

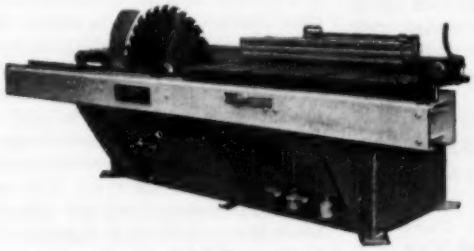
The company gives employment to more than 2,400 men and has an annual payroll of over $6,000,000.

J. B. Woods to Become Partner in New Firm

John B. Woods Jr. has resigned as assistant state forester in charge of Oregon's forest rehabilitation project and also head of insect control and

SHORT LOG BOLTER

"Built By Lumbermen For Lumbermen"

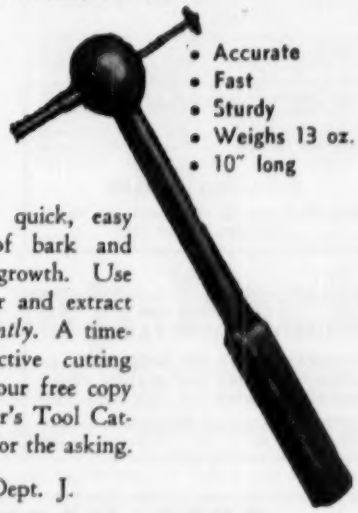


Ricker Series 1000

For working up 3-ft. to 6-ft. logs profitably. Handles up to 18 cords of 4-ft. logs per day. Saw size—36" to 40". Sturdily and efficiently engineered, yet weighs only 3600 pounds. Cuts accurately and very fast. Known as a "Snap-Dragon" it has well earned its name as a giant of a machine for getting valuable material out of short logs and pieces. Ready to go to work wherever the source of supply might be. Know its advantages and you'll want one. Ask for free folder. No obligation.

DIMENSION MILL EQUIPMENT CO.
Deansboro, New York

INCREMENT HAMMERS
MADE IN
MORA, SWEDEN



- Accurate
- Fast
- Sturdy
- Weighs 13 oz.
- 10" long

Designed for quick, easy examination of bark and recent tree growth. Use like a hammer and extract ¾" core *instantly*. A time-saver in selective cutting operations. Your free copy of our Forester's Tool Catalog is yours for the asking.

Write Dept. J.

SANDVIK SAW & TOOL
DIVISION OF SANDVIK STEEL, INC.
47 WARREN STREET NEW YORK 7, N. Y.

The Forester's WORKHORSE HALE TYPE FZZ

The Portable Hale FZZ *Centrifugal* Pumping Unit will supply from draft 60 GPM at 90 lbs., up to 150 GPM at 30 lbs.

This compact, sturdy, quick-starting unit is a "Forester's Workhorse" for fighting forest, brush, and field fires. **One state forestry department has over fifty of them in service.** The 4 cycle aircooled 8¼ H.P. engine is easy to start in any kind of weather.

OTHER HALE UNITS

*CFUB	600 U.S. GPM at 120 lbs.
*WF	150 U.S. GPM at 100 lbs.
†HPZZ	15 U.S. GPM at 200 lbs.
**NP	15 U.S. GPM at 40 lbs.

*Skid or trailer mounted. †Portable in frame, on wheels or on skids.
**Self-Priming portable.

Write for literature on Hale Fire Pumping Units.

Let us know if you want a demonstration.

HALE FIRE PUMP CO. CONSHOHOCKEN, PA.

HAZARD NURSERY SEEDER

This machine, adapted to large scale nursery planting has been used successfully in Southern State and Forest Service Nurseries for many years. Now manufactured on order. Delivery within a few weeks' time. For additional information address:

James O. Hazard, M.F., 4407 Hunt Place, Nashville 12, Tenn.

FOREST METEOROLOGIST

Fire Danger Rating . . . Weather Instruments Sales and Service . . . Weather Modification Research . . . Forecasts and Advisories

J. B. "Ben" MELIN

2806 32nd Ave. S. Seattle 44, Wash.
Telephone RA Inier 0356

Calders' Forest Road

ENGINEERING TABLES

Complete tables for field work on waterproof paper and acetate cover. Sent on approval Price 5.00

LESTER E. CALDER and DOUGLAS G. CALDER
1828 Hillyard St. Eugene, Oregon

forest research to become the junior member of the firm of John B. Woods & Son, reforestation consultants, with headquarters in Salem.

The new firm will engage in the broad field of forest management consulting services. One of its major activities will be the collection and extraction of forest tree seed which has been carried on over a period of years by J. B. Woods, Sr. under the firm name of Woodseed Co.

Woods entered the state forestry department in 1941 and served as publicity assistant for the next four years. In 1945 he was appointed assistant state forester, the position which he held until his resignation November 1.

A.P.A. Establishes Grant For Research Directory

The American Pulpwood Association is to sponsor a research fellowship at the State University of New York College of Forestry in Syracuse for the development of a Directory of Research in Growing and Harvesting Pulpwood, according to a joint announcement by W. S. Bromley, executive secretary of the American Pulpwood Association and E. D. Jahn, associate dean of the College.

Purpose of this cooperative project is to compile and post currently a directory of current and recent research and experimental work in the growing and harvesting of pulpwood. The directory will serve as a reference guide to the progress of experimental work throughout the country and as a more effective medium of coordination of efforts in this field.

A graduate fellow, on a twelve-months basis at $2400, will be appointed to assist in carrying out this project at the College.

J. E. McCaffrey Elected Vice President of International Paper Company

J. E. McCaffrey, assistant general manager in charge of woodlands operations, Southern Kraft Division, has been elected vice president of International Paper Company by the board of directors.

Mr. McCaffrey, who had been located at the company's Georgetown, South Carolina, mill as division superintendent, Woodlands Department, since 1946, was appointed to his present position in July, 1954. At that time he moved to Mobile where he will continue to make his headquarters.

He first was associated with International Paper in 1928 and after having left the company briefly during the 1930's, he rejoined in 1937 as division forester for the Arkansas-Louisiana area.

In 1938, McCaffrey was called to division headquarters in Mobile to help organize a central woodlands office. He served as general superintendent of timberlands until 1940 when he was named general superintendent of wood procurement. He resigned from the company in 1942 to rejoin the Army Corps of Engineers, reverting to inactive status with the rank of colonel in 1946.

He is a graduate of the New York State Ranger School, and is a member of the Society of American Foresters and the Society of American Military Engineers. He is a past president of the American Pulpwood Association, and is presently a director of the Forest Genetics Research Foundation, and a member of the advisory board, American Forest Products Industries, Inc.

A.F.P.I. Stresses Multiple Benefits of Tree Farming

American Forest Products Industries' board of trustees, in annual meeting November 5 in Washington, D. C., decided to develop a definite program to acquaint the public with multiple use factors which go hand in hand with private ownership of forested areas.

They adapted a statement of policy setting forth, in substance, that under tree farm management, the public interest is served through watershed protection, recreation, soil conservation, and protection of wildlife.

"Private forest land management through tree farming has as its primary objective the growing of continuous crops of trees," the policy statement said. "The forest practices and forest protection necessary to assomplish this objective result in multiple use and therefore benefit the public interest in watershed protection, preservation of the soil, maintenance of forage for game, and recreation."

Leonard G. Carpenter, president of McCloud Lumber Co., Minneapolis, and the McCloud River Lumber Co., McCloud, Calif., was re-elected president. Also elected were William Swindells, of the Willamette Valley Lumber

TREE MARKING AXES

The modern method for marking trees. Eliminate all paint problems by blazing and stamping trees with your brand. Nothing to carry but a light 2 lb. axe. 4" cut, 27", 23" or 18" handles. Priced at $10 each with one 1½" or two ¾" hardened characters on head. Special designs quoted upon request.

A. R. SMITH 10003 S. E. ECKLER AVE. PORTLAND, ORE.

Co., Portland, Ore., and W. J. Bailey, West Virginia Pulp & Paper Co., New York City, vice presidents; P. H. Glatfelter, P. H. Glatfelter Co., Spring Grove, Pa., treasurer; and William B. Greeley, of Seattle, chairman of the board.

Newly elected members of the board of trustees include J. P. Weyerhaeuser, Jr., president of the Weyerhaeuser Timber Company, Tacoma, Wash., and James D. Bronson, Cascade Lumber Co., of Yakima, Wash.

Re-elected to the board for three-year terms were W. B. Greeley; John H. Hinman, International Paper Co., New York; James L. Madden, Scott Paper Co., Boston, Mass.; N. F. McGowin, W. T. Smith Lumber Co., Chapman, Ala.; John B. Veach, Hardwood Corporation of America, Asheville, N. C.; and Vertrees Young, Gaylord Container Corporation, Bogalusa, La. Sydeny Ferguson, Mead Corporation, New York, was re-elected for a one-year term.

Government

Air Defense Plaque Awarded To Oregon Forestry Department

A citation for outstanding contribution to the air defense system was awarded November 17 to the Oregon state forestry department by Brigadier General R. W. Puryear, commander of the 25th Air Division at McCord Air Force Base.

Governor Paul L. Patterson, chairman of the State Board of Forestry, accepted the plaque of merit for the forestry department at the joint luncheon given for board members and directors of Keep Oregon Green Association.

General Puryear praised the efforts of foresters, lookouts and wardens who contributed unselffish and patriotic service in the U.S. Ground Observer Corps. The air division commander said that the spirit of cooperation among foresters was unsurpassed. On many occasions, he reported, aircraft were detected by the lookout system which had evaded the radar shield. Also, on occasion, jets have taken to the air on information furnished by lookouts and made successful interceptions before the aircraft could reach the probable target areas.

The General said very complete and accurate reports on aircraft had been received from Oregon's 140 forest lookouts. He also gave a brief description of the present air defense system of the Pacific Northwest and plans for the future.

In addition to Governor Patterson, members of the State Board of Forestry, George Spaur, state forester, and directors of Keep Oregon Green attended the luncheon.

E. W. Shaw Selected Editor for Rocky Mountain Station

Elmer W. Shaw, research forester on the staff of the Forest Service's Pacific Northwest Forest and Range Experiment Station of Portland, has been appointed editor for the Rocky Mountain Forest and Range Experiment Station at Fort Collins, Colo. This was announced Friday by R. W. Cowlin, director of the Portland station with which Shaw has been associated for the past six years. In his new position Shaw will be responsible for editing research publications and other Forest Service releases originating with the Rocky Mountain Station.

A native of Indiana, Shaw graduated in 1941 from the School of Forestry at Purdue University. He served as an officer in the U. S. Navy for four years during World War II and saw action in both the Atlantic and Asiatic-Pacific theaters. After the war he received his master's degree in forestry from the University of California. Shaw entered the Forest Service in 1947 and was assigned to the Malheur National Forest where he spent two years on timber sale work. From there he joined the staff of the Puget Sound Research Center of the Pacific Northwest and Range Experiment Station.

R. C. Brown and J. R. Hansbrough Now at Upper Darby, Pa.

Reorganization of the U. S. Department of Agriculture's research in forest insects and forest diseases in the

Rootspred
Tree Planters

3 models—Heavy-duty, rugged for rough conditions. Fit Ford, Ferguson, Case, International Super C, etc.

Standard

For heavy, stony soils, steep hillsides. Heeling wheels adjustable to properly follow tree row on hillsides. Widely used by northeastern Christmas tree growers.

Lake States

Same features as "Standard" but has scalping middle buster installed between coulter and trencher.

M-4

Extra heavy construction with 28" coulter. For partly cleared or cutover land (stumps, roots, light brush). Plants on short curves.

Write for photos, literature

ROOTSPRED
St. Petersburg, Penna.

REFORESTATOR
Mechanical Tree Planter

Manufactured by
L. W. MERIAM CO.
Elsie, Michigan

Kamp-Pack

"OUTDOOR FOOD" HELPS RANGERS, FORESTERS, TRAVEL LIGHT and FAST

Delicious non-perishable food is concentrated for easy carrying. 25 pounds finished food weighs only 9 pounds. Nothing to add but water. 12 full meals in waterproof foil packets. Used by forest rangers as regular food for lookouts, emergency food when fire-fighting. Used by foresters, too.

Write for KAMP-PACK booklet and Bernard INSTITUTIONAL FOOD LISTS for *he-man* lumberjack meals.

BERNARD FOOD INDUSTRIES . . . 2 plants to serve you
P O. Box 487, San Jose, Calif. • 559 West Fulton Street, Chicago 6, Ill.

Northeast was announced recently by Ralph W. Marquis, director of the Northeastern Forest Experiment Station, U. S. Forest Service.

Under the reorganization, R. C. Brown, entomologist, and J. R. Hansbrough, pathologist, are now members of the staff of the Northeastern Forest Experiment Station, with headquarters at 102 Motors Avenue, Upper Darby, Pa., a suburb of Philadelphia.

Mr. Brown is chief of the experiment station's new Division of Forest Insect Research. Mr. Hansbrough is chief of the new Division of Forest Disease Research.

Brown and Hansbrough were formerly located at New Haven, Conn. Most of the technical personnel in forest insect and disease research remain in New Haven. Their combined offices, at 335 Prospect Street, New Haven 14, Conn., will be known as the Forest Insect and Disease Laboratory of the Northeastern Forest Experiment Station. Philip B. Dowden is administrative officer for the New Haven Laboratory.

Forestry Employment

S.A.F. members are privileged to insert one 60-word advertisement in this column without charge. Forest industries desiring to employ foresters may insert advertisements at the rate of $4 per column inch. Copy must be received by the end of this month for an advertisement to appear in the issue after next.

Obviously, the Society cannot assume responsibility beyond making it possible for prospective employee and employer to enter into negotiations.

Positions Wanted

Forester, 26, B.S.F., 1951, desires a change toward greater responsibilities and opportunities. 2½ years experience in silviculture and forest management research. Willing to travel. Married, one child, draft free, top recommendations.
Box O, JOURNAL OF FORESTRY, Mills Building, Washington 6, D. C.

Forester and wildlife manager desires a position with private industry. Experienced in managing and developing large area for timber, wildlife, recreation, and watershed; also promoting forest management and wildlife habitat restoration with rural and civic organizations, cruising, type mapping, surveying, marketing of timber, nursery practices, planting, fire control, and public relations. B.S.F., age 42; married, 2 children.
Box P, JOURNAL OF FORESTRY, Mills Bldg., Washington 6, D. C.

Graduate forester, B.S.F., 1952, age 26, married, 1 child, veteran. Now state employed. Experience: cruising, mapping, timber marking, fire control, public relations, and management using photogrammetric means. Desire field position with private company in eastern or western states.
Box Q, JOURNAL OF FORESTRY, Mills Bldg., Washington 6, D. C.

Forester, B.S.F., N.Y. State, age 29, married, one pre-school child. Experience: 6½ years U.S. Forest Service on timber surveys, timber sale administration, land use, fire control, insect control, recreation and maintenance. Presently employed. Desire employment offering more responsibility.
Box R., JOURNAL OF FORESTRY, Mills Building, Washington 6, D. C.

Forester (M.F., Yale; M. Public Administration, Harvard—residence completed for Ph.D. economics), seeks permanent position in forest management and/or land-use economics. Special interest: research. Available: March. Currently employed as field economic research assistant, land-use project ending February. Experience also as state forest research assistant: silviculture, management. Avocational experience: still and movie photography for public relations. Veteran, 29, 2 children. Salary, though important, is secondary to position offering challenge and opportunity.
Box S, Journal of Forestry, Mills Building, Washington 6, D. C.

Forest Insect Research Expanded in Northwest

Research on forest insects is being increased by the Pacific Northwest Forest and Range Experiment Station, Forest Service, according to Director Robert W. Cowlin, by the recent assignment of two additional men.

Valentine M. Carolin has been transferred from the Northeastern Forest Experiment Station, Upper Darby, Pa. to head studies of natural control of forest insects. He graduated from the New York State College of Forestry and received a master's degree from the same institution.

Robert B. Pope, of the Portland office of the station, is being shifted from Forest Economics Research to Forest Insect Research to head studies for improving insect surveys. Pope graduated from the University of Michigan in 1940 and obtained his master's degree from Harvard University in 1948.

States Get $16 Million from National Forest Receipts

A total of $16,393,583.27 was sent in November to the forty states and two territories which contain national forest lands administered by the U. S. Forest Service.

Each state received 25 percent of the money collected by national forests within its boundaries between July 1, 1953 and June 30, 1954. The receipts came from the sale of timber, grazing fees, land use permits, and other uses of the national forests. The amounts sent varied from $97.49 for North Dakota to $4,988,206.78 for Oregon.

The law providing for these payments to the states also earmarks the money for the benefit of public schools and public roads within the counties in which national forest land is situated.

NOTICE TO INDUSTRY
Personnel Placement

A service for industrial firms, foresters, and timbermen—to find the best qualified man for the job. List your openings in forestry and allied fields with me. I can supply information on qualified men. Inquiries handled confidentially.

* * *

Foresters **send me data on your training and qualifications. Records are confidential. I maintain industry contacts and can advise you on job openings. No fee required unless position is accepted.**

Keith Cranston, *Forestry Consultant*
LELAND, MISSISSIPPI

Forest Research Activities Reorganized at Missoula, Montana

Reorganization of Forest Service research activities for the Northern Rocky Mountain area has been announced by Director Reed W. Bailey of the Intermountain Forest and Range Experiment Station. Three research activities have been organized at Missoula, Mont., to provide for a more concentrated and better integrated attack on forest and range problems of the region. Fields of work will include forest-fire protection and suppression, forest insect outbreak prevention and control, and forest, range, and watershed management.

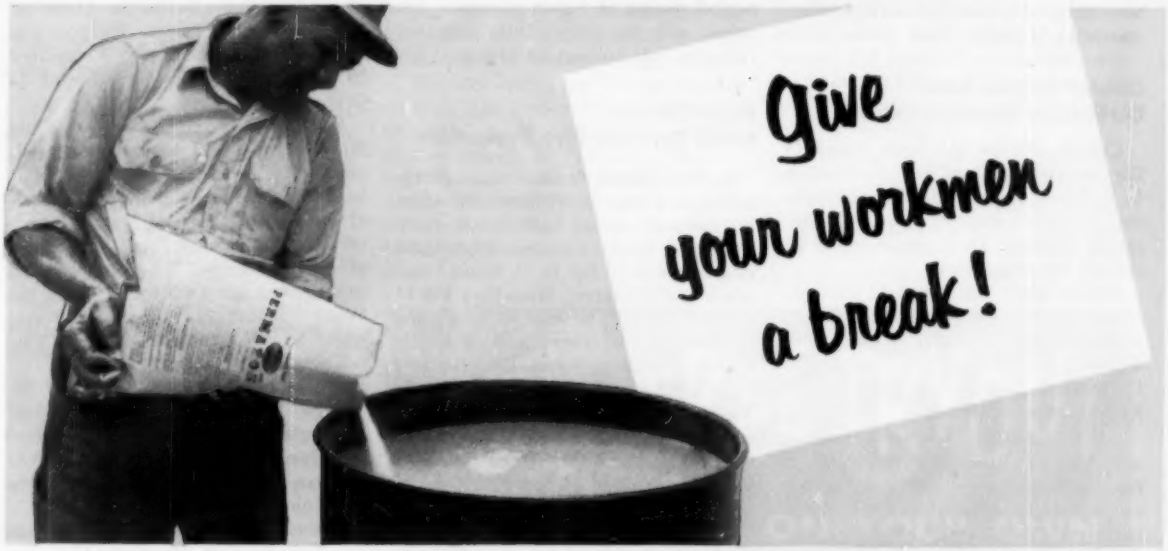
The Forest Fire Laboratory at Missoula will be designed to develop more effective fire prevention and control for the Inland West. A laboratory staff will perform basic fire research under the direction of Jack Barrows, who also serves as chief of the Division of Fire Research at the Intermountain Station.

The Forest Insect Laboratory now at Coeur d'Alene, Idaho, will be transferred to Missoula and will serve northeastern Washington, northern Idaho, Montana, northwestern South Dakota, and northwestern Wyoming. The laboratory will be under the leadership of Philip C. Johnson, who has been on the staff of the Research Center at Coeur d'Alene for a number of years. James C. Evenden, in charge of the Forest Insect Laboratory at Coeur d'Alene since its inception, has been assigned the greater responsibility of division chief in charge of the Forest Insect Research of the Intermountain Station.

The reorganization of the third unit, to be called the Field Research Center, will give emphasis to the forest and range problems of the northern Rockies in Montana and northwestern Wyoming. In addition a program of watershed-management research will be initiated.

The program of the Field Research Center will also include investigations of methods of harvesting, regenerating, and caring for regionally important timber types.

USERS OF SAP STAIN CONTROL CHEMICALS:



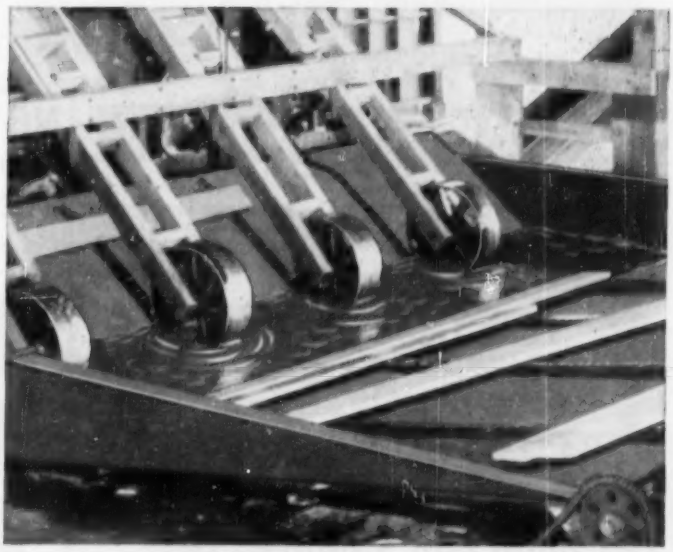
No irritating dust problem with Permatox 10-S

New ingredient makes Permatox 10-S easier to handle and mix than ever before

Since 1933 Chapman has conducted continuous research to improve sap stain chemicals and methods of application. The newest Chapman research development in this field makes Permatox 10-S practically dust-free by the addition of a new ingredient to this tried-and-proven formula.

There is no increase in price for this improved Permatox 10-S.

Permatox 10-S prevents *both* sap stain and mold in hardwoods and softwoods. Mixed with Chapman Ambrocide, it also protects lumber against damaging attacks by ambrosia beetles and other insects.



CHAPMAN CHEMICAL COMPANY
Dermon Bldg., Memphis 3, Tenn.
Terminal Sales Building, Portland 5, Ore.

Write For Free Bulletin on Stain and Insect Control

CHAPMAN®

PERMATOX 10-S

Prevents *both* sap stain and mold, in freshly cut hardwoods *and* softwoods

Leader of the Field Research Center will be Arthur L. Roe who has been engaged in forest-management research at Missoula since 1946.

Chester Jensen Joins Carbondale Research Center

Chester Jensen has been added to the research staff of the Carbondale U. S. Forest Research Center at Southern Illinois University as a silviculturist, Richard D. Lane, forester in charge, has announced.

Jensen began his duties in October, coming from six years of forest survey work with the Central States Forest Experiment Station, Columbus, O. The Carbondale Center is a part of the Experimental Station.

At Carbondale, Jensen will work with Leon S. Minckler on problems of finding better ways to grow timber crops faster and more economically in southern Illinois and similar areas. Jensen is the third new addition to the center's staff under its recently accelerated program made possible by an additional $150,000 federal appropriation for the purpose. Other personnel will be added subsequently.

Jensen received a bachelor's and master's degree in forestry from Michigan State College. He has had training with statistical methods in experimental design in forest research. He served with the army's 10th Mountain Infantry (ski troops) in 1943-45.

Signs Further South Carolina Fire Prevention

Reflected metal roadside signs carrying forest fire prevention reminders are being erected on highways in every county of South Carolina by rangers and wardens of the S. C. State Commission of Forestry. More than 450 of these signs will be erected in groups of three, spaced about 2/10 of a mile apart. The signs carry the messages "Use Your Ash Tray; Prevent Woods Fires; and Protect Little Trees," in addition to a modified Keep South Carolina Green seal. Groups cooperating with the S. C. State Commission of Forestry in this project include The Garden Club of South Carolina, the S. C. Forest Industries Committee, and the State Highway Department.

G. S. Wheeler Named Supervisor White Mountain National Forest

Appointment of Gerald S. Wheeler as supervisor of the White Mountain National Forest in New Hampshire and Maine has been announced by Regional Forester Charles L. Tebbe of the U. S. Forest Service. The post was vacated by the death on September 26 of former Supervisor Clifford L. Graham.

Mr. Wheeler goes to the White Mountain National Forest, with headquarters at Laconia, N. H., from Rutland, Vt. where he has been supervisor of the Green Mountain National Forest for the past ten years. A native of Bangor, Maine, Wheeler began his professional career in forestry on the White Mountain National Forest where he was appointed a Junior Forester in 1927.

While assistant supervisor of the George Washington National Forest in Virginia in 1933, Wheeler organized and for a time supervised the first Civilian Conservation Corps Camp in the United States.

Wheeler graduated in forestry from the University of Maine in 1926 and the following year he was granted a Master of Forestry degree at Syracuse University.

He is a Member of the Society of American Foresters and is currently vice-chairman of the New England Section of that Society.

20 MILLION TREES *a Year!*

Note Heavy Roots and Sturdy Top of Musser seedling in photo.

Seedlings for Christmas Tree and Forest Tree plantings; Transplants for Conservationists, Timber Operators and Farmers.

MUSSER offers the world's largest selection of quality trees, at a price made possible by tremendous volume.

Write for Tree Catalog, wholesale planting list and prices. Ask for Free Christmas Tree Growers' Guide.

MUSSER FORESTS, INC. BOX 26A INDIANA, PA.

SEEDS FOR NURSERYMEN

TREE — SHRUB — PERENNIAL — FLOWER — VEGETABLE

Correspondence with Seed Collectors Invited

Herbst Brothers Seedsmen, Inc.

Established 1876

678 BROADWAY NEW YORK 12, N. Y.

NOW . . new CUSHION BASE

absorbs road shocks & vibration, reduces wear, increases life of

FORESTER

SEAL TITE

DRIP-TORCH

Proved superior in over 9 years field service

•

Approved for use by U.S. Forest Service

•

NO Flash-back
NO Fuel slopping
NO air-pump
NO pre-heating
NO pressure build-up
NO explosive vapors
Instant operation

SAFE — EFFICIENT
RELIABLE — ECONOMICAL

Burns Diesel Fuel or Stove Oil

Write for folder & price list

WESTERN FIRE EQUIPMENT CO.

69 Main St., San Francisco 5

Education

Forestry School Executives Elect New Officers

At a meeting of the Council of Forestry School Executives in Milwaukee on October 23, the following officers were elected for the current year.

Chairman, Prof. Maurice K. Goddard, School of Forestry, The Pennsylvania State University, State College, Pa.

Vice chairman, Dr. Clemens M. Kaufman, School of Forestry, University of Florida, Gainesville, Fla.

Secretary, Dean Ernest Wohletz, College of Forestry, University of Idaho, Moscow, Idaho.

The Council is made up of the deans of the accredited schools of forestry.

Washington Receives Merrill and Winkenwerder Scholarship Funds

A trust fund to be established at the University of Washington by Richard D. Merrill, pioneer Northwest lumberman and philanthropist, has been approved by the Board of Regents.

The fund will be created with an initial contribution valued at $10,000, with the provision that it may be augmented later by additional gifts. The income from the fund will be used for undergraduate scholarships, graduate fellowships and postgraduate research grants in the College of Forestry. It will be known as the R. D. Merrill Forestry Research and Scholarship Fund.

In establishing the fund, Merrill stated, "It is my hope that forest resources will be perpetuated through the scientific study of forestry at the University."

A second bequest to the University, comprising the bulk of the estate of the late Mrs. Adelene M. Winkenwerder, will total $74,701, according to the Board of Regents.

Mrs. Winkenwerder, who died last year, was the widow of Professor Hugo Winkenwerder, dean of the College of Forestry from 1912 to 1944 and an acting president of the University in 1933 and 1934. He died in 1947.

The bequest, representing real estate, savings accounts, bonds, and cash, will be used for the establishment of the Hugo Winkenwerder Forestry Memorial Scholarship Fund. Income from the fund will provide scholarships for forestry students.

Washington Walker Ames Professor Announced

The University of Washington has announced the appointment of Herbert E. Dadswell as Walker Ames Professor of Forestry during the Winter Quarter of 1955. Dr. Dadswell is the officer-in-charge of the Wood Structure Section of the Division of Forest Products of the Commonwealth Scientific and Industrial Research Organization of Australia. He is also the chief research officer and assistant chief of the division.

He will conduct two seminars, one on wood structure-silvicultural relationships, and the other on the forest regions of the world. These are special courses for senior and graduate students in the College of Forestry. He will also offer an advanced course in wood technology.

In commenting on the appointment, Dean Gordon D. Marckworth of the College of Forestry indicated the likelihood that Dr. Dadswell will give several public lectures for the benefit of persons outside the college.

FREE TRYOUT
ON YOUR OWN STAND
CLINTON
CHAINSAWS
Your CLINTON dealer will furnish the saw and the fuel to introduce you to the fastest cutting one-man gasoline chainsaw built
No. CS323
now only
$179.50
without guide bar and chain
FOB CLINTON, MICHIGAN
The heart of the CLINTON CHAINSAW is the world famous CLINTON engine
Has the big chainsaw features. A full weight tool—not a toy. Special diaphragm fuel pump! You cut from any position. New on-off switch for complete power control. Safety-sight guide! Belt drive! Split second swivel! A complete family of Clinton Chainsaws for you to choose from. Clinton Engine Replacement Plan lets you change power units at less cost. Mail for giant 3-color folder. See your Clinton Dealer for free tryout.
IMMEDIATE SERVICE AND FACTORY PARTS EVERYWHERE
CLINTON MACHINE CO.
Chainsaw Division, Dept. 5-C CLINTON, MICHIGAN
Engine Division at MAQUOKETA, IOWA
Outboard Division at CLINTON, MICHIGAN
CLINTON
Over 2,500,000 Clinton Gasoline Engines Now In Use Throughout The World!

SOCIETY PUBLICATIONS BINDERS, PINS

Proceedings (1954). Milwaukee Meeting. Including all Division meetings and General Session papers presented at the Society's Annual meeting. Price $4 postpaid.

Forest Cover Types of North America. 1954 edition. Includes detailed description of approximately 250 North American forest types (exclusive of Mexico). A table lists common and botanical names of tree species and an index of forest types is included. Price $1.

Society Emblems in three pin styles. 10K gold with gold letters on dark green enamel, background surrounded by gold border. Prices lapel button $2.50; tie chain $6; pin $4.

Binder for JOURNAL OF FORESTRY. Holds 12 issues. Brown imitation leather, stiff board. Title stamped in gold foil on front cover and backbone. Price $2.

Forestry Terminology. Included are definitions of all the terms that the practicing forester uses in his daily work and encounters in forestry literature. Price $3.

Fifty Years of Forestry in the U.S.A. The dynamic story of the growth and practice of forestry in the United States for the first half century 1900-1950. Price $4.

Please send the items which I have checked.

Payment is enclosed ☐

Bill me ☐

Proceedings, 1954 ☐

Forest Cover Types of North America ☐

Society Emblem Lapel ☐ Tie Chain ☐ Pin ☐

Binder for Journal ☐

Forestry Terminology ☐

Fifty Years of Forestry ☐

Name _____

Address _____

Forest Research at Vermont Agricultural Experiment Station Extended

Research in forestry at the Vermont Agricultural Experiment Station is being extended.

Dr. William R. Adams, chairman of the forestry department, reports that three new men have been added to his staff in the past few months.

Roy E. Fordham, assistant professor and assistant forester, started work on July 1. His principle project is a survey of the marketing of forest products in Vermont.

Fred W. Taylor, instructor of forestry and assistant forester, joined the staff on August 1. He is working on classification of coniferous forest tree planting sites in Vermont based on soil and physiography.

Dean H. Urie, forestry technician, started work on October 1. He is in charge of field work at the Vermont Research Forest in Jericho. He also will make a survey on selection grading and marketing practices of natural and plantation grown Christmas trees in Vermont as they affect the producer price.

Pennsylvania To Hold Hardwood Grading Short Course

The School of Forestry of the Pennsylvania State University is offering a short course in grading of hardwood lumber. This is the third annual short course on hardwood lumber grading.

The dates are from March 14 to March 18, 1955. Enrollment will be limited and requests will be considered as they are received. The work will cover all the facts in grading and inspection of native hardwoods. Considerations of thickness, measurement, manufacture and other questions from the class will be answered.

Enrollment can be made by obtaining a registration form from the Director of Short Courses, College of Agriculture, The Pennsylvania State University, State College, Pa.

If additional information is desired, write to Orvel A. Schmidt, School of Forestry, The Pennsylvania State University, State College.

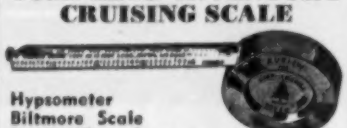
Michigan State College Fellowships Announced

Michigan State College offers ten Graduate Council Fellowships for predoctoral study for the year 1955-56. Each carries a stipend of $700.00 payable in nine monthly installments plus a waiver of course and tuition fees. Every application for a fellowship must be complete, and every applicant must have been admitted to the School of Graduate Studies, before March 1, 1955.

In addition the Board of Trustees of the Alumni Fund of the college has announced five predoctoral fellowships ranging in value from $1,000-$1,400 tenable in any subject at Michigan State College for the year 1955-56. With each fellowship a waiver of course and tuition fees is granted. Only U. S. students are eligible.

The Alumni Fund also offers one postdoctoral fellowship open to U. S. applicants, of value $3,000, for a period of ten months, September to July. This fellowship is available for research in any subject for which the college has appropriate facilities. It carries with it the same housing privileges as are accorded to faculty members. Inquiries should be addressed to the Dean of the School of Graduate Studies, Michigan State College, East Lansing, Michigan. Completed applications must be received before March 1, 1955.

COMPLETE INVENTORY CRUISING SCALE



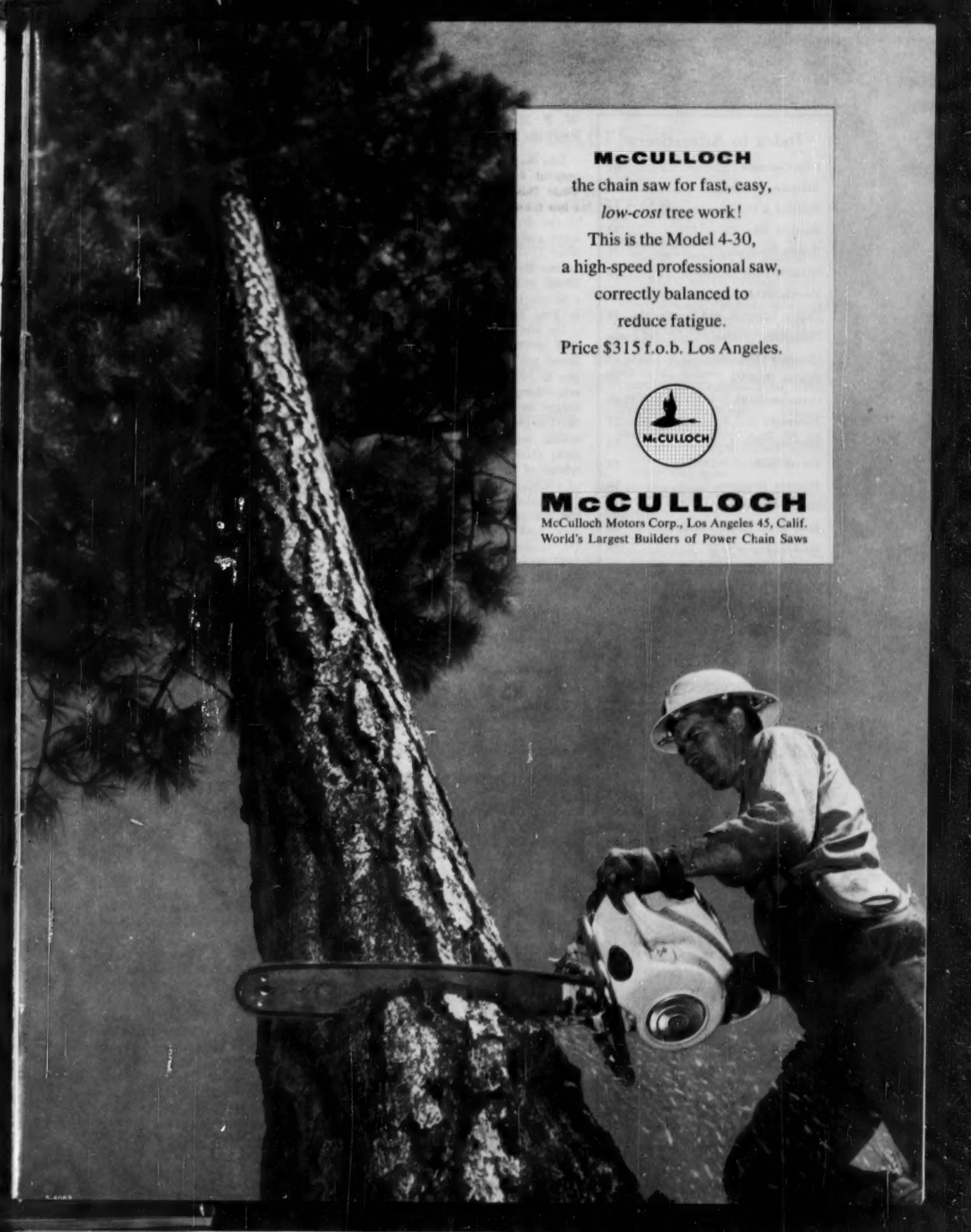
Hypsometer
Biltmore Scale
Rigid When Open
Flexible 6-foot Steel Tape $3.00 EACH
Handy Chrome-plated Case 1¾" Dia.
IMMEDIATE DELIVERY
CARL W. GETZ, *President*
KURFEW, INC.
Lansdale, Pa.

PROCEEDINGS
(1954)
Milwaukee Meeting

A special volume containing all Division and General Session papers presented at the Society's Annual meeting held in Milwaukee, Wis., October 24-27, 1954. **Postpaid $4 per copy.** Available about February 1st.

Send order with check **now.**

Society of American Foresters
Mills Bldg., Washington 6, D. C.


McCULLOCH
the chain saw for fast, easy,
low-cost tree work!
This is the Model 4-30,
a high-speed professional saw,
correctly balanced to
reduce fatigue.
Price $315 f.o.b. Los Angeles.
McCULLOCH
McCULLOCH
McCulloch Motors Corp., Los Angeles 45, Calif.
World's Largest Builders of Power Chain Saws

Index to Advertisers

Allis-Chalmers	67
Atkinson, S. Gayley	73
Banzhaf & Co., George	73
Bartlett Mfg. Co.	74
Belsaw Machinery	72
Bernard Food Industries	79
Bozett, W. J.	73
Calder, Lester E. and Douglas G.	78
Caterpillar Tractor	3rd Cover
Chapman Chemical	81
Clinton Machine	83
Cranston, Keith	73-80
Dimension Mill Equipment	77
Eastman, Wm. A.	73
Forest Seeds of California	74
Forestry Suppliers	70
Hale Fire Pump	78
Hall, A. G.	73
Hazard, James	78
Herbst Brothers Seedsmen	82
Homelite Corporation	4th Cover
Howerton, T. M., Jr.	73
Keuffel & Esser Co.	75
Kurfew	84
Lemieux, Frank J.	73
Lind Co., A. L.	72
McCulloch Motors	85
Melin Meteorological Service	78
Meriam Co., L. W.	79
Musser Forests	82
Nelson Company	68
Pacific Marine Supply	76
Pond & Moyer	73
Prentiss & Carlisle	73
Price, Wm. H.	73
Rich Forest Fire Tool	74
Rootspred	79
Sandvik	77
Sebrell Corp., J. B.	69
Schultz, C. D. & Co., Ltd.	73
Sewall Co., James W.	73
Silva	72
Smith, A. R.	78
Smith Co., D. B.	2nd Cover
Southern Coatings & Chemical	71
Southern Seed Co.	74
Suncrest Evergreen	72
Western Fire Equipment	82
Weyerhaeuser Timber	2
Woodlot Seed Co.	72

W. F. McCulloch Succeeds Paul M. Dunn as Oregon Dean

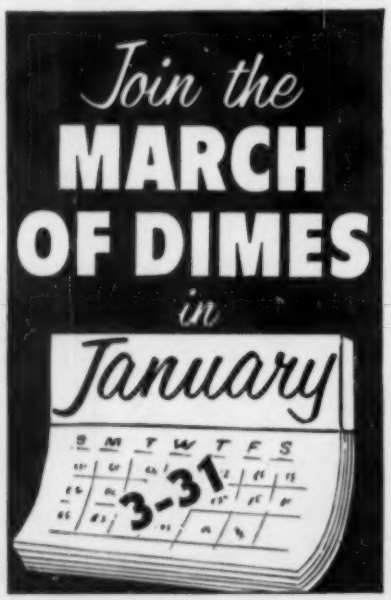
Dr. W. F. McCulloch has been appointed dean of forestry at Oregon State College by the State Board of Higher Education. He has been head of the department of forest management and head counselor in forestry since 1945.

Dr. McCulloch succeeds Paul M. Dunn, who resigned effective January 1 to join the St. Regis Paper Co. staff in New York.

Dr. McCulloch first joined the O.S.C. staff in 1937 as assistant professor of forest management. He left the campus in 1942 to be assistant state forester for Oregon, then in 1945 returned as head of the forest management department. In 1952-53 he was acting dean while Dean Dunn was away directing the organization of a school of forestry at the University of Chile.

Dr. McCulloch studied forestry at the University of Washington and New York State College of Forestry. He received his doctor's degree in 1947 from the University of Oregon. In 1936 and 1937, he was director of the Michigan State College forest experiment station and for two years taught at the New York State College forestry summer camp.

During his career in forestry, McCulloch has served on many national, regional and state committees including the S.A.F. committees on employment and forestry school accreditation.



Georgia Forestry Faculty and Research Program Expanded

As a result of an expanded teaching and research program at the School of Forestry, University of Georgia, five men have recently joined the staff of that institution, according to D. J. Weidell, dean of the School.

J. Reid Parker, a graduate of the school who received an M.F. degree from Duke University and continued his studies toward a Ph.D. at Iowa State, has been appointed instructor. J. S. Greer, Jr., joined the staff during the summer to assist in forest research work being done by the Georgia Experiment Station. He received both his B.S.F. and M.F. degrees from the University of Georgia. More recently Drs. Meravin Reines and Laurence C. Walker have been added to the research staff of the school to work on projects in cooperation with the Georgia Forestry Research Council and the U. S. Forest Service. Dr. Reines is from New York and received his B.S.F., M.F., and Ph.D. degrees from Pennsylvania State University. Dr. Walker is originally from Washington, D. C., and received his B.S.F. degree at Pennsylvania State University. He went to Yale for his M.F. and to the New York State College of Forestry at Syracuse for his Ph.D. degree.

In addition to these men, Dr. W. A. Campbell, Research Center Leader at the School for the U. S. Forest Service, has announced the transfer of Dr. Thomas C. Nelson to the school, from Coweeta Hydrologic Laboratory near Franklin, N. C. Dr. Nelson, a silviculturist, is one of a number of specialists who will come to the University to work on a hardwood utilization project. This project is financed by a recent special appropriation of $175,000 by Congress. Work will be centered at the School of Forestry under the direction of the Southeastern Forest Experiment Station. Dr. Campbell will be in charge of the program.

The research staff assigned to this project will consist of seven trained forest management specialists, one wood technologist or forest pathologist, and five men trained in the field of wood utilization.

The primary purpose of this study is to find new markets for the hardwood species growing in the Piedmont region, determine the prevalent defects in the major species, the cause and prevention of these defects, ways of improving the utilization of low grade and little used Piedmont hardwoods and how best to manage the existing stands of hardwoods.

Consulting Foresters

Approved for Listing on January 1, 1955, by the

SOCIETY OF AMERICAN FORESTERS

The following List of Consulting Foresters is published by the Society of American Foresters for the information of prospective clients.

Individuals listed are members of the Society of American Foresters and as such are believed qualified and competent to perform the technical services specified. However, the Society cannot assume responsibility for the actions of individuals or firms listed.

Permission to publish or reproduce this list in whole or in part, but without unauthorized additions, is hereby granted. Revised lists will be issued annually

Code of Fields of Specialization

1. Arboriculture and tree preservation.
2. Cost and economic studies of forest operations.
3. Forest and wood utilization.
4. Forest management and silvicultural practice.
5. Forest protection from disease.
6. Forest protection from fire.
7. Forest protection from insects.
8. Forest taxation.
9. Game and wildlife management.
10. Logging engineering.
11. Market studies and trade promotion (forest products).
12. Naval stores operations.
13. Pulpwood operations.
14. Range management.
15. Surveying and mapping.
16. Timber valuation and appraisal.
17. Timber volume and quality estimates.
18. Tree planting and reforestation; reproduction studies.
19. Wood preservation.
20. Wood seasoning.
21. Wood technology.

Raymond D. Adolph, 44 Roe Park, Highland Falls, New York.
Territory: Southeastern New York.
Specialization: 4, 5, 6, 7, 18.

Ernest E. Ahler, Consulting Forester, Route 2, Bishop Road, Knoxville, Tennessee.
Territory: Southeast.
Specialization: 2, 3, 4, 6, 13, 16, 17, 18. Also preparation, negotiation or advertisement, and administration of timber sales for large and small timber landowners, and boundary line establishment.

Thos. W. Alexander, Consulting Forester, Waynesville, North Carolina.
Territory: South, Central States, and Appalachians.
Specialization: 2, 4, 11, 16, 17.

John R. Allison, 483 W. Palmetto Street, Florence, South Carolina.
Territory: Eastern South Carolina.
Specialization: 3, 4, 6, 7, 13, 16, 17, 18.

Glenn O. Antonie, Consulting Forester, 411 South Walnut, Demopolis, Alabama.
Territory: Alabama, Mississippi.
Specialization: 2, 3, 4, 5, 6, 7, 8, 12, 13, 15, 16, 17, 18. Also agent for absentee timber owners; timber sales and cutting supervision; forest litigation.

Milton Applefield, Consulting Forester, 317 Edgewood Circle, Conway, South Carolina.
Territory: South coastal plain.
Specialization: 3, 4, 10, 13, 15, 16, 17, 18. Also sawmill efficiency studies; litigation and damage claims.

S. Gayley Atkinson, Consulting Forester, Huntingdon Road, Huntingdon Valley, Pennsylvania.
Territory: Pennsylvania.
Specialization: 1, 18.

Henry L. Bango, Consulting Forester, P.O. Box 4072, Shreveport, Louisiana.
Consultant: Frank Gaensehals.
Territory: Northern Louisiana.
Specilization: 3, 4, 5, 16, 17, 18. Also purchase and sale of timbered properties.

George Banzhaf & Company, 662 North Water St., Milwaukee 2, Wisconsin.
Territory: Not Limited.
Specialization: 2, 3, 4, 8, 11, 13, 15, 16, 17.

W. R. Barnhill, 1302 11th Avenue, Albany, Georgia.
Territory: Southeastern U. S.
Specialization: 4, 17, 18. Also forest damage investigations, tree planting (contract).

Belanger and Bourget, Land Surveyors and Forest Engineers, 86 Cote de la Montagne, Quebec, Canada.
Consultant: M.-Albert Bourget.
Territory: Canada, especial Quebec.
Specialization: 2, 3, 4, 10, 11, 13, 15, 16, 17, 19, 20, 21. Also boundary lines.

Frank W. Bennett & Associates, Consulting Foresters, 1216 Louisiana National Bank Bldg., Baton Rouge, Louisiana. (Field Hdqrs. at Norwood, La. and Natchitoches, La.)
Consultants: Frank W. Bennett, W. C. Snyder and Lewis C. Peters.
Territory: Southern U. S.
Specialization: 3, 4, 6, 10, 11, 16, 17, 18. Retained as consultants by medium size landowners (300 to 20,000 acres). Manage all forest land resources, including timber, grazing, wildlife, minerals, etc. Make plant location surveys for large wood using plants (pulp mills).

Bigley and Feiss, Foresters, Inc., 767 Blair Blvd., Eugene, Oregon.
Consultants: Sherman Feiss, John Venator, Norman Sorensen.
Territory: Washington, Oregon, California.
Specialization: 2, 3, 4, 6, 15, 16. Also sustained yield plans, supervision of contract logging, and timberland sales.

John C. Billingsley, Forest Consultant, 924 Fair Street, Newberry, South Carolina.
Territory: South Carolina and Georgia.
Specialization: 3, 4, 6, 9, 10, 15, 16, 17, 18.

Bishop Brothers, Consulting Foresters, Marion, South Carolina.
Consultants: H. F. Bishop, R. Q. Bishop.
Territory: South Carolina and southeastern U. S.
Specialization: 3, 4, 6, 8, 10, 13, 15, 16, 17, 18.

L. L. Bishop, Forest Consultant, 7034 Airline, Houston 9, Texas.
Territory: East Texas.
Specialization: 4, 6, 16, 18.

Lewis M. Boice, Consulting Forester, Orangeburg, South Carolina.
Territory: Within 100 miles of Orangeburg.
Specialization: 4, 6, 15, 16, 17.

Robert K. Boydell, 810 West Pine St., Hattiesburg, Mississippi.
Territory: Mississippi, Alabama, Louisiana.
Specialization: 2, 3, 4, 12, 13, 16, 17, 18. Also forest mapping from aerial photographs, and growth studies.

William J. Bozett, Consulting Forester, Logan, Ohio.
Territory: Ohio and adjoining states.
Specialization: 2, 3, 4, 5, 6, 7, 10, 11, 13, 15, 16, 17, 18, 20. Timber and forest management and services and marketing, damage appraisals. Qualified to serve industry.

Allen W. Bratton, Consulting Forester, Shelterwood, Cooperstown, New York.
Territory: Northeast.
Specialization: 4, 5, 6, 7, 8, 11, 15, 16, 17, 18.

Brown and Brown, Forest Engineers, 614 Lewis Building, Portland 4, Oregon.

Consultants: Eugene R. Walsh (S.A.F. Associate Member), Samuel Rotschy.
Territory: Pacific coast.
Specialization: 2, 3, 4, 6, 8, 10, 11, 12, 15, 16, 17, 18.

Nelson C. Brown, Consulting Forester, 122 Dorset Road, Syracuse 10, New York. During summers, Milford, Pa.
Territory: Northeast.
Specialization: 2, 3, 8, 10, 11, 13, 16, 17.

Paul E. Bruns, 119 Mount Avenue, Missoula, Montana.
Territory: Not limited.
Specialization: 2, 4, 8, 11, 16, 17.

Henry Bull, 1514 Fern Street, New Orleans 18, Louisiana.
Territory: Not limited.
Specialization: Ghost-writing and professional assistance in the preparation of forestry manuscripts and reports.

Charles H. Bunting, Timber Cruiser, 2455 Placer St., Redding, California.
Territory: California.
Specialization: 2, 10, 15, 16, 17.

California Foresteering, 429 Main Street, Placerville, California.
Consultant: Wm. B. Berry.
Territory: California pine region.
Specialization: 2, 3, 4, 10, 16. New solutions to the old problems of logging, milling, and timber management.

N. D. Canterbury, Consulting Forester, 4214 St. Emanuel Street, Apt. 3, Houston 4, Texas.
Territory: Texas and southeastern U. S.

Dudley C. Carey, 116 Fairmeade Road, Louisville 7, Kentucky.
Territory: Not limited.
Specialization: Forest and wood utilization, wood preservation, wood seasoning, wood technology. Also planning for wood conversion operations.

Carl M. Carpenter, Consulting Forester, Nashville, Indiana.
Territory: Indiana.
Specialization: 2, 4, 5, 6, 15, 16, 17, 18.

C. Dana Chalfant, R. D. No. 2, Gibsonia, Pennsylvania.
Territory: Central and western Pennsylvania, eastern Ohio, northern West Virginia.
Specialization: 4, 6, 9, 16, 18.

J. Wayne (Pete) Chalfant, 3135 Sussex Road, Raleigh, North Carolina.
Territory: North Carolina, South Carolina, Virginia.
Specialization: 1, 2, 3, 4, 6, 8, 10, 11, 13, 15, 16, 17, 18. Also licensed land surveyor North Carolina.

Edward J. Clancy, 1916 Sylvan Road, S.W., Atlanta, Georgia.
Territory: Northern Georgia and adjoining states.
Specialization: 4, 15, 16, 17. Also agent for timber owners.

Floyd F. Clark, Consulting Forester, Sky Ranch, Box 756, Ocala, Florida.
Territory: Southeast.
Specialization: 2, 3, 4, 6, 8, 9, 12, 13, 14, 15, 16, 17, 18. Also sale of timber properties; combined timber—cattle operations in the Southeast; insurance company representation for timber and range land.

Stuart F. Clark, Consulting Forester, Box 144, Bellaire, Texas.
Territory: Southern U. S.
Specialization: Forest management, appraisals, investments.

Francis H. Clifton, Private Forester, 1408 North Boulevard, DeLand, Florida.
Territory: Southeast U. S. A.
Specialization: 3, 4, 13, 16, 17. Also three dimensional diorama exhibits of forestry and forest industries for promotion or advertising purposes.

John D. Coffman, 286 Lenox Ave., Oakland 10, California.
Territory: Principally California.
Specialization: 5, 6, 7, 16. Also forest and park recreational management.

Connwood, Inc., South Main Street, Cheshire, Connecticut.
Consultants: Ralph C. Hawley, Michael M. Pochan, Jr., Sherman H. Perkins.
Territory: Connecticut and adjacent areas.
Specialization: 3, 4, 10, 11, 13, 15, 17, 18, 19, 21.

Consulting Foresters, 4970 Kingsley Drive, Indianapolis, Indiana.
Consultants: Robert F. Davis, D. K. Goodwin.
Territory: Indiana.
Specialization: 4, 10, 11, 16, 17, 18.

David B. Cook, Consulting Forester, 12 McPherson Terrace, Albany 6, New York.
Territory: Eastern New York.
Specialization: Planted larch.

Philip T. Coolidge, Consulting Forester, 31 Central Street, Bangor, Maine.
Territory: Not limited.
Specialization: 2, 4, 8, 10, 13, 15, 16, 17, 18. Also farm appraisal.

William T. Cox, Consulting Forester and Biologist, 2186 Doswell Avenue, St. Paul 8, Minnesota.
Territory: General.
Specialization: Appraisals of forest properties; development of furbearers and other wildlife; selection of new locations for woodworking plants.

Keith Cranston & Associates, Leland, Mississippi.
Consultant: Keith Cranston.
Territory: Mississippi River Delta, and entire Gulf States Hardwood Bottomlands and Pine Types from Tennessee-Kentucky south.
Specialization: Bottomland Hardwood management, and supplemental commercial cruising. Retained in consultant capacity by firms operating in the South, and as Consultant-Manager for private landowners of bottomland hardwood and pine tracts.

C. P. Cronk, 10 Crown Ridge Road, Wellesley, Massachusetts.
Territory: Not limited.
Specialization: Studies in industrial forestry, with particular reference to problems in utilization, production, merchandising, and public relations.

Lucas M. Dargan, Consulting Forester, P. O. Box 167, Darlington, South Carolina.
Territory: Coastal Carolinas.
Specialization: 4, 9, 16, 17, 18. Also forest mapping and timber location studies from aerial photographs.

John F. Davis, Ironshire and Mumford, Snow Hill, Maryland.
Territory: Eastern and Southeastern states.
Specialization: 2, 3, 4, 11, 13, 16, 17, 18.

Paul B. Davis, Consulting Forester, 118 E. Malfa Road, Oak Ridge, Tennessee.
Territory: Tennessee, Kentucky.
Specialization: 1, 2, 3, 4, 13, 16, 17, 18.

Randle J. Dedeaux, Consulting Forester, P. O. Box 52, Perkinson, Mississippi.
Consultant: Jed P. O'Neal (on military leave).
Territory: Southern Mississippi; longleaf and slash pine types.
Specialization: 4, 13, 15, 17. Also growth studies, timber marking and marketing, and agent for absentee timberland owners.

Deep South Consulting Foresters, P. O. Box 580, Tuscaloosa, Alabama; Box 151, Gulf Breeze, Florida. C. H. Schaeffer, Chief Forester.
Territory: Southeastern United States.
Specialization: 1, 4, 5, 6, 7, 10, 16, 17, 18. Also property management, litigation and damage appraisals, and claims for individuals, companies, and trust officers.

W. T. Doherty, Consulting Forester, 421 Morningside Dr. N.E., Albuquerque, New Mexico.
Territory: Arizona, New Mexico.
Specialization: 4, 15, 16, 17. Also land classification.

William A. Eastman, Jr., Consulting Forester, William A. Eastman & Co., Inc., 410 Green Building, Seattle 1, Washington.
Territory: Pacific Northwest.
Specialization: 10, 15, 16, 17, 18. Also preparation and administration of timber sales, land appraisal, timberland brokerage, and timberland management.

Nils B. Eckbo, Industrial Forestry Consultant, 26 Rhodes Avenue, Parktown, Johannesburg, South Africa.
Territory: Southern Africa.
Specialization: Industrial forestry.

W. G. Edwards, 503 West Fairmount Ave., State College, Pennsylvania.
Specialization: 3, 10, 13, 15, 16, 18. Also small sawmill problems, both logging and milling phases.

Carl F. Ehelebe, 5921 S. E. Monroe St., Milwaukie 22, Oregon.

Territory: Mexico pine regions.
Specialization: Cost and economic studies of forest operations, forest and wood utilization, market studies and trade promotion (forest products), timber valuation and appraisal.

Inman F. Eldredge, Sr., 1354 Moss Street, New Orleans 19, Louisiana.
Territory: Lower South.
Specialization: Resource surveys for large operations; advice and counsel in large-scale land purchase programs; consultation with forestry staffs on management policy and practice in larger operations.

Employment Service, Forestry Personnel, P. O. Box 128, Leland, Mississippi.
Consultant: Keith Cranston, Personnel director.
Specialization: Personnel placement service provided professional foresters and timbermen.

L. J. Enright, Consulting Forester, 322 Scott Drive, Silver Spring, Maryland.
Territory: Maryland; not limited.
Specialization: 1, 6, 15, 18. Also park management and policy; landscape planting and design.

Charles F. Evans, Consulting Forester, 2867 Piedmont Road, Atlanta, Georgia.
Territory: Southeastern U. S.
Specialization: 4, 6, 16, 17, 18. (Registered Forester under Georgia state law.)

Farmcraft Associates, Inc., Forest Managers, 619 Washington Street (Box 3233) Alexandria, Louisiana and Box 6822, Houston, Texas.
Consultants: John P. Carroll, Leo McDonald.
Territory: Southern U. S.
Specialization: Forest investments and technical forest management for private and industrial holdings.

Fenner & Day, Company, Free Space Combustion Engineering, 4355 Bermar Avenue, El Sobrante, California.
Consultant: Ralph L. Fenner.
Territory: California.
Specialization: 2, 4, 6, 14. Wildland fire control and use.

David S. Findlay, Consulting Forester, 20 East 5th Street, Jamestown, New York.
Territory: Western New York and Pennsylvania.
Specialization: 4, 15, 16, 17.

George M. Fisher, Consultant Landscape Forester, P. O. Box 300, Tyler, Texas.
Territory: Northeastern Texas.
Specialization: 1, 5, 7, 9, 18. Also city forestry and shade tree problems; landscape design, construction, and maintenance; forest parks and recreational planning.

C. V. Fisk, Consulting Forester, P. O. Box 524, Chariton, Iowa.
Territory: Iowa, Missouri, Nebraska, Kansas, Illinois.
Specialization: 4, 9, 16, 17. Also farm forestry.

Reginald D. Forbes, Consulting Forester, R.F.D. 1, Ambler, Pennsylvania.
Territory: Eastern U. S.
Specialization: 4, 6, 17, 18. Also forest resource surveys of timber available to manufacturing plants in specified territories.

Forest Land Management Co., P. O. Box 1046, Morgantown, West Virginia.
Consultant: Thomas G. Clark.
Territory: Northern West Virginia, Southwestern Pennsylvania, Western Maryland.
Specialization: Forest land appraisal, forest real estate, timber sales, and markets.

Forest Products Management Company, 1504 Broad Street, Camden, South Carolina.
Consultants: H. R. Oliver and C. S. K. Sorensen.
Territory: Carolinas.
Specialization: 3, 4, 6, 11, 13, 15, 16, 17, 18, 20. Also land appraisals, timber and land sales. South Carolina registered land surveyor and dogwood and hickory industry consultant.

Forestry Aids, Manning, South Carolina; 355 Lincoln Road, Miami Beach, Florida. Phone: 581526; 5-4055.
Consultants: Seymour I. Somberg, Richard E. Haas.
Territory: Southeastern U. S.
Specialization: 2, 3, 4, 8, 10, 11, 13, 15, 16, 17, 20. Acquisition and management for investors; forest resource surveys for industry.

Forestry Associates, Inc., Box 122, Gray, Maine.
Consultants: Stephen C. Jacobs, R.F.D. #2, Gorham, Maine; Fred J. McLeary, Gray, Maine.
Territory: Maine and adjacent areas.
Specialization: 2, 3, 4, 6, 8, 13, 15, 16, 17, 18, 20. Also sustained yield plans, contract logging supervision, stumpage sales, and scaling. Small woodlot management a specialty. Tree marking.

Forestry Associates, Inc., P. O. Box 72, Hart, Michigan.
Territory: Michigan.
Specialization: 3, 4, 5, 6, 7, 9, 11, 13, 15, 16, 17, and 18.

Forestry Consulting Services, Deluxe Building, 297 West Michigan Avenue, Jackson, Michigan.
Consultant: George D. Blair.
Territory: Nationwide.
Specialization: 1, 2, 4, 11, 16, 19. Also various forest growth and vegetative control planning services to public utility industries.

Forestry Suppliers, Inc., Consulting Foresters and Suppliers, Battlefield Station, Jackson 4, Mississippi.
Consultants: Ben C. Meadows, Purvis R. Huff.
Territory: Gulf States.
Specialization: 3, 4, 6, 13, 15, 16, 17, 18. Also forest land analysis and management, growth studies, timber and land sales, and a complete line of supplies and equipment for foresters and timber owners.

R. C. Fraunberger, Forest Products Business Consultant, 3 South Homestead Drive, Yardley, Pennsylvania.
Specialization: 2, 3, 4, 10, 11, 16, 17, especially in hardwoods, domestic and foreign.

E. A. Friend, Jr., 211 Causey Ave., Suffolk, Virginia.
Territory: Tidewater and Eastern Shore of Virginia, Northeast North Carolina.
Specialization: 4, 15, 16, 17. Absentee landowners' agent, damage, trespass, and condemnation claims.

Emanuel Fritz, Consulting Forester, 102 The Uplands, Berkeley 5, California.
Territory: West; pine, redwood, and fir.
Specialization: 2, 3, 4, 6, 10, 11, 16, 17, 18, 19, 20, 21. Also consultant on state forest and park management and policy.

LeRoy Frontz, Consulting Forester, Allenwood, Pennsylvania.
Territory: Eastern U. S.
Specialization: 3, 4, 5, 6, 7, 9, 16, 17, 18. Also landscaping, forest and ornamental nurseries, farm forestry, forest parks and recreation, landuse planning, soil conservation, farm evaluation and appraisal.

William E. Garvey, Jr., La Plata, Maryland.
Territory: Southern Maryland.
Specialization: Timber cruising, appraisal and marking.

John D. Gilmour, Consulting Forester, 5823 McLynn Avenue, Montreal, Quebec, Canada.
Territory: Not limited.
Specialization: 2, 4, 8, 10, 16, 17. Also tropical logging.

Nathan B. Golub, Consulting Forester, Buckstone Farm, Washington Crossing, Pennsylvania.
Territory: Pennsylvania and New Jersey.
Specialization: 4, 15, 16, 17, 18. Also water management plans. Registered engineer and surveyor in Pennsylvania.

Vernon A. Good, Consulting Forester, American Bank Building, Portland, Oregon.
Territory: Oregon, Washington, Idaho, Northern California.
Specialization: 2, 4, 8, 13, 14, 16, 17, 18. Timber marking, sales contracts and supervision, acquisition, aerial photo inventory, fire damage appraisals, and timber tax assistance. Also watershed and land use management.

R. W. Graeber, Consulting Forester, 303 Hillcrest Road, Raleigh, North Carolina.
Territory: North Carolina.
Specialization: 4, 6, 13, 16, 17, 18. Also buying and selling timber and timberlands as service to either buyer or seller; adjusting problems arising from over-cutting or trespass.

Green's Timber Service, Johnson City, Tennessee.
Consultant: L. Stanley Green.
Territory: Southeastern U. S.
Specialization: 2, 3, 4, 6, 10, 13, 16, 17, 18. Also custom sawmilling.

Kenneth Wayne Guenther, Forest Products Industrial Engineer, Coos Bay, Oregon.
Territory: Oregon, Washington, and California.
Specialization: Those fields relative to the industrial engineering applications to the forest products industries.

Alvin B. Hafer, Consulting Forester, Laurinburg, North Carolina.
Territory: North Carolina, South Carolina, and Southeast.
Specialization: 4, 15, 16, 17. Also purchase and sale of timbered properties.

Albert G. Hall and Associates, 1740 K Street, NW, Washington 6, D. C.
Specialization: 2, 3, 4, 5, 6, 7, 8, 11, 13, 16, 17, 18. Also Washington representation.

Giles G. Hall, Professional Forester, 402 Cumberland Avenue, North Augusta, South Carolina.
Territory: South Carolina, Georgia.
Specialization: 2, 3, 4, 5, 6, 7, 10, 11, 13, 16, 17, 18. Also tree pruning in planted stands.

Jack M. Hall, Consulting Forester, 23½ East Central Avenue, Moultrie, Georgia.
Territory: Georgia and northern Florida.
Specialization: 4, 5, 6, 7, 11, 12, 15, 16, 17, 18.

Francis G. Hambrook, Consulting Forester, East Sandwich, New Hampshire (mailing address, R.F.D., Center Harbor, N. H.).
Territory: New Hampshire.
Specialization: 2, 4, 15, 17. Also management of timber properties and agent for absentee landowners, selective cutting, timber marking and marketing assistance, timber stand improvement work, including improvement cuttings in immature stands.

Hammon, Jensen, and Wallen, Mapping and Forestry Services, 660 Hegenberger Road, Oakland 21, California.
Consultants: Herbert A. Jensen, Arnold F. Wallen.
Territory: United States and foreign.
Specialization: 2, 3, 4, 6, 8, 10, 11, 13, 15, 16, 17, 18. Also planimetric and topographic mapping, land net delineation, general land classification for appraisal purposes and ranchland management, and aerial photogrammetric consulting service.

David H. Hanaburgh, Consulting Forester, Buchanan, New York.
Territory: Northeast.
Specialization: 2, 3, 4, 9, 10, 11, 13, 16, 17. Also negotiation of rights for hunting, fishing, trapping, and water storage.

Gene M. Harris, Registered Consulting Forester, 779 Arkansas Street, Tallahassee, Florida.
Territory: Florida, Georgia, and Alabama.
Specialization: 3, 4, 5, 6, 7, 8, 9, 12, 13, 15, 16, 17, 18.

Joseph F. Havel, Box 11, Pawley's Island and Georgetown, South Carolina.
Territory: North Carolina, South Carolina, Georgia, and Florida.
Specialization: 3, 4, 10, 11, 13, 16, 17.

E. T. Hawes, Consulting Forester, 2204 White Oak Drive, Valdosta, Georgia.
Territory: Southeast.
Specialization: 2, 4, 8, 11, 12, 13, 16, 17, 18.

Ralph W. Hayes, Consulting Forester, 2241 Myrtle Avenue, Baton Rouge, Louisiana.
Territory: Gulf States.
Specialization: 2, 3, 13, 15, 16, 17. Also investigation and settlement of claims regarding timber in use in the South.

George S. Haynes, Consulting Forester, S. 321 Bowdish Road, Opportunity, Washington.
Territory: Western Montana, northern Idaho, eastern Washington.
Specialization: 4, 6, 10, 15, 16, 17, 18.

Hiram L. Henderson, Manufacturer of Dry Kilns, 119 Stone Ridge Drive, Syracuse, New York.
Territory: Principally eastern states.
Specialization: 20. Also construction of lumber dry kilns.

V. W. Herievich, Consulting Forester, Porter's Neck Plantation, Wilmington, North Carolina.
Territory: North Carolina, South Carolina.
Specialization: 4, 6, 15, 16, 17, also forest fire damage appraisals.

Halsey M. Hicks, Consulting Forester, Box 575, Brattleboro, Vermont.
Territory: Not limited.
Specialization: 2, 3, 4, 8, 15, 16, 17.

Monterey L. Hoist, Consulting Forester, P. O. Box 125, East Greenwich, Rhode Island.
Territory: New England.
Specialization: 3, 4, 6, 9, 10, 13, 15, 16, 17, 18, 21.

Douglas F. Horan, Consulting Forester, 316 Windsor Street, Lakeland, Florida.
Territory: Florida.
Specialization: 4, 11, 15, 16, 17.

William P. House, Consulting Forester, Chesham, New Hampshire.
Territory: New Hampshire and adjacent areas.
Specialization: 2, 3, 4, 16, 17. Marking and stumpage sales.

Richard F. Howard, Forestwald, Box 14, Franklinville, New York.
Territory: Pennsylvania, New York, New England.
Specialization: 3, 4, 6, 15, 16, 17, 18.

T. M. Howerton, Jr., Forestry Consultant, Madison, Florida.
Territory: Southeastern states.
Specialization: Marketing, Management.

John E. Hudson, 1709 N.W. 11th Road, Gainesville, Florida.
Territory: Southeastern United States.
Specialization: 4, 12, 16, 17.

G. W. Hult, Consulting Forester, 3029 Johnson Street, Corvallis, Oregon.
Territory: Oregon, California, and southwestern U. S.
Specialization: 4, 16, 17. Also estate woodlands management; negotiation of cooperative sustained yield units; timber sales, acquisition, and exchanges.

LeRoy W. Huntington, Consulting Tropical Forester, 52 Wesley Street, Baldwin, New York.
Territory: Latin America, Orient, Africa.
Specialization: 2, 3, 4, 10, 11, 15, 16, 17, 18; and tropical hardwoods.

R. Wilson Hutchison, Consulting Forester and Logging Engineer, 167 Walnut Lane, Eugene, Oregon.
Territory: Washington, Oregon, California.
Specialization: 2, 3, 4, 6, 10, 15, 16, 17. Registered professional engineer of the State of Oregon.

Intermountain Timber Service, 1815 South 10th Street, Caldwell, Idaho.
Territory: Idaho and a portion of eastern Oregon.
Specialization: 2, 4, 6, 8, 16, 17. Also forest engineering. Timber valuation and logging costs, and access road construction costs.

Gorham E. Jackson, Consulting Forester, 604 West Main Street, Washington, North Carolina.
Territory: Eastern North Carolina, southeastern Virginia. All forest types.
Specialization: 2, 4, 6, 9, 10, 13, 15, 16, 17, 18. Also investigations of forest resources for pulp and paper companies, and land agent for absentee timberland owners.

M. E. Jelley, Consulting Forester, 122 Haywood Avenue, Chattanooga 5, Tennessee.
Territory: Southeastern and eastern states.
Specialization: 2, 3, 4, 10, 11.

David G. Jennings, Consulting Forester, 110 Spring Street, Port Jefferson, New York.
Territory: New York.
Specialization: 1, 3, 4, 6, 15, 18.

F. J. G. Johnson, 709 Metropolitan Bldg., Vancouver, B. C., Canada.
Territory: British Columbia (no regional limitation).
Specialization: 2, 3, 4, 6, 11, 15, 16, 17. Also park and municipal forest development.

Ralph S. Johnson, Laurinburg, North Carolina.
Territory: Eastern Carolinas.
Specialization: 3, 4, 6, 13, 15, 16, 17.

Robert W. Jones, Rt. 2, Box 2187. Bellevue, Washington.
Territory: Washington.
Specialization: 10, 11, 15, 16, 17, 18. Also photogrammetry and court cases concerning boundary disputes.

E. V. Jotter, Consulting Forester, 30 Cedarlawn Drive, Dayton 5, Ohio.
Territory: Ohio, Kentucky.

Specialization: 3, 4, 6, 9, 11, 16, 17, 18. Also development and management of community forests conservation education, cooperation with soil conservation districts.

Frank E. Karpick, 134 Kay St., Buffalo 15, New York.
Territory: Northeastern United States
Specialization: 1, 5, 7. Landscaping, and planting and maintenance programs for city shade trees.

S. G. Keedwell & Company, Consulting Foresters, Emporia, Virginia.
Territory: Eastern and southern U. S.
Specialization: 3, 4, 10, 11, 13, 15, 16, 17. Also forest litigation and purchase and sale of land and timber.

John F. Kellogg, Forester, Urania, Louisiana.
Territory: Louisiana; pine and hardwood.
Specialization: 4, 5, 11, 16, 17.

Kiefer and Quaile, Consulting Foresters, Lakeville, Connecticut.
Consultants: George C. Kiefer, Jr. and George E. Quaile.
Territory: Eastern U. S.
Specialization: 4, 6, 8, 15, 16, 17, 18. Also management of timber properties and plantations, timber marking and marketing, watershed management, and agent for woodland owners.

H. Thorn King, Consulting Forester and Land Surveyor, Hancock, New Hampshire.
Territory: Southwestern New Hampshire.
Specialization: 2, 3, 4, 15, 16, 17, 18. Also farm forestry and private forestry: marking; registered land surveyor.

G. E. Knapp, Consulting Forester, 661 Forest Hill Road, Macon, Georgia.
Territory: Southern states.
Specialization: 2, 4, 10, 11, 13, 16, 17, 18.

Robert F. Knoth & Company, Foresters, Appraisers, Surveyors, 39 Broad Street, Charleston 3, South Carolina.
Consultants: Robert F. Knoth, Russell Wells.
Territory: Domestic and foreign.
Specialization: 4, 6, 10, 11, 13, 15, 16, 17, 18. Land agent for absentee timberland owners; foreign timberland investigations; veneer log inspection and procurement; timber investments.

Arthur Koehler, Wood Technologist, 1959 Thayer Ave., Los Angeles 25, California.
Specialization: Wood utilization.

The Langdale Company, P. O. Box 980, Valdosta, Georgia.
Consultants: Hartley Langdale, Jr., T. E. Connell.
Territory: Georgia, northern Florida; slash pine belt.
Specialization: 2, 3, 4, 6, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19.

Frank M. Langford, Waverly, Tennessee.
Territory: Middle Tennessee, South Kentucky, and North Alabama.
Specialization: Timber management—evaluation.

Lauderburn-White, 1204 Adeline Street, Hattiesburg, Mississippi.
Consultants: D. E. Lauderburn, John B. White.
Territory: South Mississippi and adjacent territory.
Specialization: 4, 11, 16, 17. Complete timber sales service, marking, finding buyers of stumpage, timber sale contracts, supervision and inspection of cutting operations, technical marketing assistance to small sawmills.

Frank J. Lemieux, Consulting Forester, 833 Whitney Building, New Orleans, Louisiana.
Territory: Southern states, Mexico, Central and South America.
Specialization: 2, 4, 6, 13, 15, 16, 17.

Paul C. Lemon, Consulting Forester, State College, Albany 3, New York.
Territory: New York and New England.
Specialization: 1, 6, 9, 14. Also commercial pilot, applications of aviation to forestry.

T. A. Liefeld, Consulting Forester, Thomasville, Georgia.
Territory: Florida, Georgia.
Specialization: 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 15, 16, 17, 18.

L. D. Lloyd, Consulting Forester, Flying L Ranch, Glenwood, Washington.
Territory: Worldwide.
Specialization: 2, 3, 4, 6, 8, 10, 13, 15, 16, 17.

Harvey J. Loughead, Consulting Forester, 399 Vanderbilt Road, Biltmore Station, Asheville, North Carolina.
Territory: Eastern U. S.
Specialization: 3, 4, 12, 13, 16, 17. Also watershed management.

Robert T. MacDougall, Jr., 124 Cresta Drive, Ukiah, California.
Territory: Coast pine and southern redwood regions of California.
Specialization: Timber cruising, forest management, mapping.

Donald K. Maissurow, Consulting Forester, New Haven Avenue, Derby, Connecticut.
Territory: New England.
Specialization: 1, 4, 5, 7, 15, 16, 17, 18. Also landscape forestry.

Carol W. Marlow, 4232 Redonda Lane, Dayton 6, Ohio.
Territory: Ohio.
Specialization: 1, 5, 7. Landscaping, planting, and city shade tree maintenance programs.

E. D. Marshall, Consultant in Forest Products, 541 Humason Ave., Lufkin, Texas.
Territory: Southern and Western United States; Mexico, Central and South America.
Specialization: 3, 11, 13, 19, 20, 21.

Edward A. McAllister, 311 Lynchburg Avenue, Colonial Heights, Virginia.
Territory: Virginia and Southeast.
Specialization: 3, 4, 9, 10, 11, 13, 16, 17.

Thomas A. McFarland, Consulting and Contracting Forester, 60 Holman Avenue, Athens, Georgia.
Territory: Georgia.
Specialization: 2, 4, 10, 15, 16, 17. Also timber, timberland, and farmland broker.

James T. McMahon, P. O. Box 88, Kountze, Texas.
Territory: Texas and Louisiana.
Specialization: 4, 13, 16, 17, 18. All phases of forest land management.

Philip C. Meinzer, Consulting Forester, Route 3, Kokomo, Indiana.
Territory: Indiana.
Specialization: 1, 4, 16, 17, 18.

Fred B. Merrill, Consulting Forester, Box 261, Clinton, Louisiana.
Territory: Mississippi and Louisiana, within 100 miles of Baton Rouge.
Specialization: 4, 5, 6, 7, 11, 13, 16, 17. Also buying and selling timberlands; training estate and company personnel; and Gaylord pulpwood dealer in East and West Feliciana Parishes.

James W. Meteer Consulting Forester, R. D. 2, Wooster, Ohio.
Territory: Ohio, neighboring states.
Specialization: 2, 3, 4, 11, 16, 17, 18. Also Christmas tree management.

William H. Meyer, Consulting Forester, West Rupert, Vermont.
Territory: Primarily Southwestern Vermont.
Specialization: 2, 3, 4, 11, 16, 17, 18. Also farm management and conservation education.

Raymond M. Miller, Consulting Forester, P. O. Box 802, Jamestown, New York.
Territory: Pennsylvania, New York, Ohio.
Specialization: 4, 16, 17. Also timber and lumber marketing service.

Milliken Forestry Co., 31 Heathwood Circle, Columbia, South Carolina.
Consultant: William F. Milliken.
Territory: Southeast, principally South Carolina.
Specialization: 3, 4, 6, 11, 13, 15, 16, 17, 18. Also sustained yield plans and contract tree planting; timberland agent for absentee timberland owners.

William J. Mills, Forest Engineer, 201 Volunteer Building, Chattanooga 2, Tennessee.
Territory: Southeastern states, Mexico.
Specialization: 3, 4, 11, 13, 15, 16, 17.

Malcolm A. Milne, Consulting Forester and Landscape Engineer, 433 Clay Avenue, Rochester, New York.
Territory: Northeast.
Specialization: 1, 5, 7, 18. Also landscaping, estate development and management, and forest recreation.

R. B. Milne, Consulting Forester, Box 371, Petersburg, Virginia.
Territory: Eastern states; all forest types.
Specialization: 3, 4, 10, 16, 17.

Stuart Moir, Forest Counsel, Western Forestry and Conservation Association, 712 U. S. National Bank Building, Portland 4, Oregon.
Territory: United States, British Columbia, Alberta, Canada.

Robert Moore, Consulting Forester, Danville, Pennsylvania.
Territory: Not restricted.
Specialization: 2, 3, 4, 6, 8, 10, 11, 13, 15, 16, 17, 18, 19. Also bankruptcy cases, trade association work, coal lands, trusteeship cases, litigation and damage claims, estate problems.

R. A. Morin, Consulting Forester, 2532 Sunset Ave., Greenville, North Carolina.
Territory: Eastern North Carolina.
Specialization: 4, 13, 16, 17, 18. Also growth studies, timber marking and marketing, and agent for absentee timberland owners.

George W. Morrill, Jr., Consulting Forester, 13½ South Spring Street, Concord, New Hampshire.
Territory: New Hampshire, Maine, Vermont.
Specialization: 4, 13, 15, 16, 18. Also landscaping, forest recreation, and beautification.

Charles H. Moyer, Consulting Forester, R.F.D. #2, Newfield, New York.
Territory: Northeast.
Specialization: 4, 10, 15, 16, 17.

Marion N. Nance, Inland Empire Timber and Land Service, W. 1104 Fifteenth Avenue, Spokane 41, Washington.
Territory: Pacific Northwest.
Specialization: 2, 3, 4, 6, 15, 16, 17. Also timber sale contract preparation and administration; ownership and cutting line establishment; and public domain land status, laws, and regulations.

National Timber Consultants, Box 497, Salem, Missouri.
Consultants: Ed Woods, Charles Kirk.
Territory: Central and southern states.
Specialization: Management information, land appraisal, and valuation, mapping and estimating.

New England Forest Industries, Inc., 3 North State Street, Concord, New Hampshire.
Consultants: Walter L. Koenig, Concord, N. H.; Dr. Gordon M. Day, Contoocook, N. H.; Richard L. Johnston, Center Harbor, N. H.; Arthur Peabody, Center Sandwich, N. H.; Glenn Bergey, Tamworth, N. H.; Eugene Carpenter, Boscawen, N. H.; Robert Eggleston, Center Sandwich, N. H.; Thomas Loring, Concord, N. H.; Parker Whipple, Tamworth, N. H.; Bradford Monk, Penacook, N. H.
Territory: New England.
Specialization: Planting, selective logging, appraisals, forest land brokerage, intermediate cuttings, marking, surveys-cruises.

New England Forestry Foundation, 3 Joy Street, Boston 8, Massachusetts.
Consultants: J. Milton Attridge, Chief Forester; Robert T. Bolton, Albert J. Boris, Allison G. Catheron, II, Stanley B. Coville, Herbert L. Crafts, Frederic P. Elwert, Richard H. Illinik, Kenneth E. Jones, Gerald C. Knickerbocker, William N. Lane, Allan W. Plumb, Donald R. Poppema, Harrison S. Ripley, Richard L. Sawyer.
Territory: New England.
Specialization: 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, 18.

New England Silvicultural Service, Athol Road, Petersham, Massachusetts.
Consultant: Fred M. Hunt.
Territory: Central New England.
Specialization: 4, 10, 15, 16, 17, 18. Also management of pine plantations.

Samuel A. Newman, P. O. Box 156, Everett, Washington.
Territory: Washington.
Specialization: 8, 10, 15, 16, 17.

Nittany Timberlands, Inc., P.O. Box 191, State College, Pennsylvania.
Consultants: Richard C. Bedger, Donald L. Dick, P. F. English, H. Arthur Meyer, R. M. Pyle, Orvel A. Schmidt, Frank J. Wawrynovic.
Territory: Pennsylvania.
Specialization: 4, 9, 13, 16, 17, 18.

Leon A. Nix, Consulting Forester and Logging Engineer, Box 82, Port Credit, Ontario, Canada.
Territory: Not limited.
Specialization: 2, 3, 4, 6, 10, 13, 15, 16, 17. Also farm woodlot management.

Northeast Forestry Service, R. D. 1 (Pike County), Hawley, Pennsylvania.
Consultant: Stanley Mesavage.
Territory: Northeast and Middle Atlantic Region.
Specialization: 3, 4, 10, 11, 15, 16, 17.

Northern Timber Services, Curtis R. Lytle, Consulting Forester, Box 365, Wellsboro, Pennsylvania.
Territory: North central Pennsylvania.
Specialization: 11, 15, 16, 17. Also sugar-bush, Christmas tree, and watershed management.

Northern Tree Co., Inc. Petoskey, Michigan.
Consultants: Thomas F. Schweigert, George E. Young and William J. McDowell.
Territory: Michigan.
Specialization: 1, 4, 5, 6, 7, 15, 16, 17, 18. Also contract tree planting; registered land surveyor.

Ernest Nutting & Co., Consulting Forester, Box 51, Camden, South Carolina.
Associate: Royal E. Cummings.
Territory: The Carolinas and Georgia.
Specialization: 4, 13, 15, 16, 17, 18. Serving timberland owners.

Joseph P. Ogrinc, Consulting Forester, 15 Mesabi Drive, Virginia, Minnesota.
Territory: Northern Minnesota.
Specialization: 4, 15, 16, 17, 18. Also growth studies, woodlot management.

Wm. B. Osborne, Consulting Forester, 2167 N. W. Marshall Street, Portland, Oregon.
Territory: Western states, British Columbia.
Specialization: 6, 16.

Floyd L. Otter, 15 Dayton Avenue, Fresno, California.
Territory: Central California.
Specialization: 11, limited to advice and technical assistance to persons interested in buying or selling tree and shrub seeds, and forest products used for ornamental purposes. By mail only.

Charles R. Page, Jr., Forest Land Manager and Consultant, 415 Friar Road, Chattanooga 11, Tennessee.
Associates: James D. Brown and George W. Holston.
Territory: Southeastern states.
Specialization: 4, 7, 11, 15, 16, 17, 18.

Penta Post and Treating Co., Box 5, Tuttle, Idaho, and 610 Bacon Drive, Boise, Idaho.
Consultants: Vernon Ravenscroft, Steele Barnett.
Territory: Idaho.
Specialization: 1, 2, 3, 4, 6, 14, 15, 16, 17, 18, 19.

Pomeroy & McGowin, Forest Managers, Monticello, Arkansas and Chapman, Alabama.
Consultants: L. K. Pomeroy, Julian F. McGowin (S.A.F. Associate Member), Z. W. White, T. R. Scott, Jr., W. V. Gandy, D. W. Samson.
Territory: Southern states, South America.
Specialization: 4, 8, 11, 13, 16, 17, 18. Also aerial forest surveys.

Pond & Moyer, Inc., Co., Consulting Foresters, 107 Homestead Road, Ithaca, New York.
Consultant: James D. Pond.
Territory: New York and Northeast, Latin America; northern hardwoods, spruce-fir, central hardwoods, tropical woods.
Specialization: 1, 2, 3, 4, 8, 10, 11, 13, 15, 16, 17, 18, 21.

Prentiss & Carlisle Company, Inc., Timberland Service—Engineers, 107 Court Street, Bangor, Maine.
Consultants: George T. Carlisle, Philip P. Clement, Robert W. Averill, George D. Carlisle, Edward K. Brann, Forest B. Nelson, Samuel L. Fuller.
Territory: United States, Canada.
Specialization: 2, 3, 4, 8, 10, 11, 13, 15, 16, 17, 18.

W. H. Price, Forest Consultant, 2626 West Lynn Street, Seattle 9, Washington.
Specialization: 1, 4, 6, 7, 8, 16, 17.

John G. Rawls Co., Consulting Foresters, 408 Rogers Avenue, Macon Georgia.
Consultant: John G. Rawls (S.A.F. Affiliate Member).
Territory: Southeast.
Specialization: 10, 12, 13, 15, 16, 17.

A. B. Recknagel, P. O. Box 15, Ithaca, New York.
Territory: Anywhere in continental United States.
Specialization: Forest management, forest utilization (particularly pulp and paper).

Reed Forestry & Equipment Co., Consulting Foresters, Box 102, Smithfield, North Carolina.
Consultant: R. E. Reed.
Territory: Southeastern states; all forest types.
Specialization: 2, 3, 4, 11, 13, 15, 16, 17, 18. Also custom sawing and sale of forestry equipment.

Tom Reimer, Consulting Forester, Box 395, Albany, Georgia.
Territory: No restrictions.
Specialization: 2, 3, 4, 6, 10, 12, 13, 15, 16, 17, 18.

Charles E. Reynolds, 7715 S. E. 32nd Avenue, Portland 2, Oregon.
Territory: Washington, Oregon, and Northern California.
Specialization: 4, 10, 15, 16, 17, 18.

Owen L. Riley, Consulting Forester, 12-A Country Club Apts., Columbus, Georgia.
Territory: Georgia and Alabama.
Specialization: 4, 7, 9, 16, 17. Also agent for timberland owners; timber marketing and assistance; damage appraisal; aesthetical forestry practices; planning for special forest areas, private parks, etc.

Robinson Improvement Company, St. Augustine National Bank, St. Augustine, Florida.
Consultant: Allen D. Nease.
Territory: Florida and South Georgia.
Specialization: 2, 3, 4, 5, 6, 7, 9, 12, 13, 15, 16, 17, 18.

A. P. Russell, Forest Engineer, 11 Maplewood Drive, Sumter, South Carolina.
Territory: Not limited, but principally southern region.
Specialization: 2, 3, 4, 10, 11, 13, 15, 16, 17, 18. Also forest resource surveys for industry, timberland acquisition and sales, contract logging supervising, log scaling and grading.

Sable Mountain Corporation, 68 Phillips Street, Rutland, Vermont.
Consultant: Richard C. Rose.
Territory: Central Vermont.
Specialization: Woodland management, including marking and marketing of standing timber and trained work crew for planting, pruning, and timber stand improvement. Also operate own forest.

Eino Sainio, Consulting Forester, 320 W. Helen St., Newberry, Michigan.
Territory: Eastern Upper Peninsula of Michigan.
Specialization: 3, 4, 13, 15, 16, 17. Registered land surveyor.

Leslie A. Sample, Consulting Forester, Route 2, Box 826, Shreveport, Louisiana.
Territory: Arkansas, Louisiana, Texas.
Specialization: 3, 4, 5, 6, 7, 13, 14, 15, 16, 17.

Roy Dale Sanders, Visual Education Technician, Rural Route 6, Evrodale, Brainerd, Minnesota.
Territory: Unlimited.
Specialization: Forester, wildlife technician, photographer. The entire production supervision of 16 millimeter color educational motion pictures, including script writing, direction, photography, editing, and sound supervision. Also production of color and black and white still picture visual education material.

Sandhill Forestry Company, 206 Surginor Road, Rockingham, North Carolina.
Consultant: Walter J. Marshburn, Jr.
Territory: Southeastern United States.
Specialization: 3, 4, 6, 13, 16, 17, 18. Also woodland property sales.

Joseph A. Schmidt, Consulting Forester, Box 470, Charleston, South Carolina.
Territory: Southeast.
Specialization: 4, 13, 15, 16, 17. Also growth studies, timber marking.

C. D. Schultz & Co., Inc., Foresters and Engineers, Forest Consultants, 946 White-Henry-Stuart Building, Seattle, Washington.
Consultants: C. D. Schultz, R. D. Schultz.
Territory: Oregon, Washington, California mainly; but no regional limitations.
Specialization: 2, 3, 4, 6, 8, 10, 11, 15, 16, 17, 18, 20.

C. D. Schultz & Co., Ltd., Foresters and Engineers, Forest Consultants, 325 Howe Street, Vancouver, British Columbia.
Consultants: C. D. Schultz, R. D. Schultz and 18 members of the Canadian Institute of Forestry. Present staff, 50 members.
Territory: No regional limitations.
Specialization: 2, 3, 4, 6, 8, 10, 11, 13, 15, 16, 17, 18, 19, 20.

James W. Sewall Company, Consulting Foresters, Old Town, Maine, and Fredericton, New Brunswick, Canada.
Consultants: Frank M. Call, Charles G. Reed, Carleton C. Young, Jr., Theodore C. Tryon (S.A.F. Affiliate Member), Earl W. Raymond, Edwin Forsythe.
Territory: Northeast.
Specialization: 3, 4, 5, 8, 13, 15, 16, 17, 18. Also aerial photography.

R. B. Shannon & Associates, Registered Surveying—Consulting Forestry, Colwell-Arnold Building, Kittanning, Pennsylvania; also Indiana Theatre Building, Indiana, Pennsylvania.
Consultants: Robert B. Shannon, Joseph F. Gray.
Territory: Pennsylvania, New York, Ohio, West Virginia.
Specialization: 2, 4, 15, 16, 17, 18. Also timber damage appraisals; farm appraisals; construction layout.

Arthur E. Sherman, Jr., Box 783, Brookings, Oregon.
Territory: Washington, Oregon, California.
Specialization: 10, 15, 16, 17.

James R. Simmons, Consulting Forester, 30 Gordon Street, Bel Air, Maryland.
Territory: Eastern states.
Specialization: 2, 3, 4, 10, 15, 16, 17, 18.

William R. Sizemore & Co., Foresters and Surveyors, Tallassee, Alabama.
Consultants: William R. Sizemore, William T. Ogletree.
Territory: Alabama.
Specialization: 2, 3, 4, 8, 11, 13, 15, 16, 17, 18.

Samuel S. Snook, P. O. Box 521, Walterboro, South Carolina.
Territory: South Carolina.
Specialization: 4, 15, 16, 17.

Dean Solinsky, Hobart Bldg., San Francisco 4, California.
Territory: California.
Specialization: Timberland appraisals and management.

Southeastern Foresters, Forest Consultants, 234 6th Avenue, North, Jacksonville Beach, Florida.
Consultants: Nelson B. Blocker, D. Eric Bradshaw.
Territory: Southeastern U. S.
Specialization: 3, 4, 6, 8, 12, 13, 15, 16, 17, 18. Also timber resource investigations; timberland management; timber and land sales; insurance company representative for loans on forest properties.

Southern Timber Management Service, Home Office, 205 S. 32nd St., Birmingham, Alabama; Branch Offices, 404 Montgomery Ave., Sheffield, Alabama; P. O. Box 964, Auburn, Alabama; P. O. Box 262, Lyons, Georgia.
Consultants: J. M. Bradley, H. E. Murphy, W. Vickery, J. D. Seaman, Harry S. Larsen.
Territory: South and Central Atlantic.
Specialization: 1, 2, 3, 4, 10, 11, 13, 15, 16, 17, 18. Also acting as land agent and forester in charge for private, commercial, and absentee-owned timberlands of all sizes

with optional complete timber stand improvement cutting, milling, and T.S.I. operations as a service under contract. Contracted objectives under long range management contracts offered.

Frank Spearey, Consulting Forester, Licensed State Land Surveyor, P. O. Box 1249, Jacksonville, Texas. Branch office, Rusk, Texas, George K. Goldsberry in charge.
Territory: Gulf States.
Specialization: 4, 15, 16, 17. All phases of land management.

Everett R. Stanford, Consulting Forester, 409 North Atlantic Boulevard, Alhambra, California.
Territory: Southern California; mountain watersheds, recreational areas.
Specialization: 1, 5, 6, 7, 18. Also forest watershed management, erosion control, mountain forest home sites, forest park planning and management, structural pest control.

T. J. Starker and Son, 3755 Van Buren Street, Corvallis, Oregon.
Operating consultants: T. J. Starker, Bruce Starker.
Territory: Oregon.
Specialization: 1, 3, 4, 10, 16, 19, 21.

J. F. Stauss, Consulting Forester, 9 Nowlan Road, Hillcrest, Binghamton, New York.
Territory: Northeast and Canada.
Specialization: 2, 3, 4, 8, 10, 11, 13, 15, 16, 17, 18. Also marketing and other forest products; litigation and damage claims.

Fred Stell, Consulting Forester, P.O. Box 42, Glenwood Springs, Colorado.
Territory: Colorado, Wyoming, New Mexico.
Specialization: 4, 6, 9, 14, 15, 16, 17, 18.

Raymond E. Stevens, Consulting Forester, 4416 McCulloch Street, Duluth 4, Minnesota.
Territory: Northern parts of Minnesota, Wisconsin.
Specialization: 4, 15, 16, 17, 18. Also field investigation and forest litigation.

John W. Stock, Consulting Forester and Licensed Land Surveyor, Tupper Lake, New York.
Territory: Adirondack Mountains.
Specialization: 3, 4, 10, 15, 16.

Edward Stuart, Jr., Operating and Consulting Forester, Avalon, Virginia and Hertford, North Carolina.
Territory: Eastern U. S.
Specialization: 2, 3, 4, 10, 11, 13, 14, 15, 16, 17, 18. Also investigations and arbitration of claims; operational management in manufacturing and marketing of forest products.

W. W. Talbert, Forest Consultant, 1112 Union Road, Lufkin, Texas.
Territory: Texas and surrounding states.
Specialization: 4, 6, 16, 17, 18.

Texas Pine, Inc., Box 348, Conroe, Texas.
Foresters: Stuart F. Clark, Glenn E. Martin.
Territory: Southern U. S.

Tillinghast & Reed, Consulting Foresters, Madison, West Virginia.
Consultants: John Tillinghast, Marvin Reed, Robert Keiling.
Territory: West Virginia, eastern Kentucky, western Virginia.
Specialization: 3, 4, 6, 15, 16, 17, 18, 19, 20. Timberlands in coal producing areas a specialty; services available on job basis or on annual retainer fee basis. Also dealers in Homelite chain saws.

J. M. Tinker, Registered Forester, P. O. Box 298, Statesboro, Georgia.
Territory: Southeastern Georgia.
Specialization: Timber cruising for small owners.

Tree Farm Management Service, 364 East Broadway, Eugene, Oregon.
Consultants: Verne D. Bronson, Chief Forester, Roger W. Burwell, Lyle H. Seymour, Thomas D. Vandershule, Keith Petrie.
Territory: Oregon and Washington.
Specialization: 3, 4, 5, 6, 7, 8, 15, 16, 17, 18. Complete tree farm management, inventory and special studies of forest lands, salvage harvest supervision, forestry research, aerial photo procurement and interpretation.

Henry H. Tryon, Consulting Forester, 258 Mountain Road, Cornwall-on-Hudson, New York.
Territory: New York and New England.
Specialization: Sprout hardwoods.

William H. Utley, P. O. Box 645, New Bern, North Carolina.
Territory: North Carolina.
Specialization: 4, 15, 16. Also industrial investigations, tax evaluations—public and private.

John C. Van Camp, Jr., Consulting Forester, 2028 Hawthorne Drive, Rockford 115, Illinois.
Territory: Northern Illinois, southern Wisconsin.
Specialization: 4, 5, 6, 7, 15, 16, 17, 18. Also farm and estate forestry, litigation and damage claims, landscaping.

James M. Vardaman & Company, Morris Building, Laurel, Mississippi.
Consultant: James M. Vardaman.
Territory: Mississippi, southern Alabama, eastern Louisiana.
Specialization: 16, 17. Also own and operate medium-sized tree farm.

Wall and Larson, Foresters, 2508 J Street, Sacramento, California.
Territory: Western states.
Specialization: 2, 3, 4, 6, 7, 8, 10, 11, 15, 16, 17, 18. Also licensed surveying; aerial photo interpretation; land and timber sales and supervision; land valuation and appraisal; log scaling service.

Robert D. Washburn, Forestry Consultant, Route 1, Box 461, Marquette, Michigan.
Territory: Upper Michigan and the Lake states.
Specialization: 2, 4, 10, 15, 16, 17. Also land appraisal. Registered surveyor, State of Michigan.

Arthur J. Weinheimer, Consulting Forester, R.F.D. #1, Old Chatham, New York.
Territory: Eastern New York.
Specialization: 4, 18.

Edward H. Werner, Consulting Forest Engineer, 3122 H Street, Sacramento, California.
Territory: California.
Specialization: 3, 4, 10, 16. Also timber and log buyer, logging inspector and personal representative for buyers and sellers of timber and range lands.

Western Timber Services, Rt. 2, Box 503, Medford, Oregon, and 2520 I Street, Arcata, California.
Consultants: Robert E. Kleiner, Everett E. Givens.
Territory: Not restricted.
Specialization: 2, 4, 8, 10, 15, 16, 17, 18.

J. Atwood Whitman, Consulting Forester, Glendon, North Carolina. Branch office at Warsaw, North Carolina.
Territory: Eastern and southern United States.
Specialization: 2, 3, 4, 8, 15, 16, 17, 18. Also forest damage appraisal, forest litigation, growth analysis, timber type maps and municipal forestry.

S. A. Wilde, Soils Department, University of Wisconsin, Madison 6, Wisconsin.
Territory: Wisconsin, Minnesota, Michigan, Missouri, Illinois, Indiana, Ohio.
Specialization: 18. Including survey of forest tracts, selection of planting sites, management of forest nursery soils.

Richard E. Wilson, 126 Kelvin Place, Ithaca, New York.
Territory: Not restricted.
Specialization: 18. Establishment and care of plantations.

S. Leigh Wilson, Consulting Forester, 857 Congaree Drive, Florence, South Carolina.
Specialization: 3, 4, 16, 17, 18.

Paul T. Winslow, Consulting Forester, Staatsburg, Dutchess County, New York.
Territory: Northeast.
Specialization: 1, 3, 4, 11, 15, 16, 17, 18.

K. B. Wood and Associates, Inc., 2623 N.W. Industrial Street, Portland 10, Oregon.
Territory: National.
Specialization: 2, 10, 15, 16, and 17.

Woodland Managers, P. O. Box 542, Lake City, Florida.
Consultants: Philip J. Moses, General Manager, L. A. Hetrick, K. R. Swinford, E. W. Gemmer.
Territory: Southeastern United States.
Specialization: Aerial photo inter-

pretation, cruising, damage appraisal, forest management planning, forest maps, growth and yield computations, land surveying, land valuation, tree marking, timber marketing, tree planting, insect problems.

J. E. Woodman, Barnett Bank Building, Jacksonville 2, Florida.
Territory: Eastern United States and Canada.
Specialization: 3, 4, 8, 12, 13, 16, 18.

Herman Work, 1005 Selma Blvd., Staunton, Virginia.
Territory: General.
Specialization: 2, 3, 4, 6, 11, 13, 16. Especially qualified in economics of pulpwood and use of leftovers for pulping.

Robert E. Worthington, Consulting Forester, Quilcene, Washington.
Territory: Olympic Peninsula.
Specialization: 2, 10, 15, 16, 17. Also registered professional engineer and land surveyor.

James G. Yoho, Consulting Forester, 613 High Street, Brownsville, Pennsylvania.
Territory: Eastern United States.
Specialization: 2, 8, 11, 16, 17. Appointments by mail preferred.

Lawrence W. Zach, Consulting Forester, Route 2, Box 281, Woodburn, Oregon.
Territory. Western Oregon.
Specialization: 4, 15, 16, 17.

E. A. Ziegler, Consulting Forester, College Park, Lewisburg, Pennsylvania.
Territory: Middle Atlantic States and Southeastern States to and including Florida.
Specialization: 2, 3, 4, 6, 8, 12, 13, 15, 16, 17, 18.

The Society of American Foresters

The Society of American Foresters is a professional organization of technically trained foresters. It is a democratic, nonpolitical, nonprofit association of over 10,000 members.

As stated in its Constitution, the objects of the Society are to represent, advance, and protect the interests and standards of the profession of forestry, to provide a medium for exchange of professional thought, and to promote the science, practice, and standards of forestry in America.

Membership in the Society of American Foresters is recognition of a man's professional abilities and attainments. No person can acquire such recognition if it is not deserved.

The Society is governed by a president, vice president, and nine other Council members. Policies established by the Council are translated into action programs which are administered by the executive secretary whose office is in the Mills Building, Washington, D. C.

An annual meeting of the Society includes technical sessions arranged by the eleven Divisions which specialize in forest management, silviculture, private forestry, forest economics, forest products, forest recreation, forest wildlife management, range management, watershed management, public relations, and education. Other features of the meeting include sessions on general topics and a joint conference of the Council and Section delegates.

Sections are regional units of the Society. The United States, its territories, and Canada are divided into 21 Sections which elect their own officers, hold meetings, and conduct appropriate projects and activities. Many Sections have subsidiary units called Chapters which hold informal meetings and field trips to acquaint foresters with each other and with local forestry matters.

The JOURNAL OF FORESTRY is a monthly publication of the Society. Other publications include *Forestry Terminology, Fifty Years of Forestry, Forestry Handbook* (now in preparation), and others.

Through its publications and meetings the Society provides a medium for the exchange of professional information and promotes cooperation among foresters and with those in allied fields.

By encouraging its members to promote the adoption, use, and improvement of forestry practices, the Society endeavors to extend the benefits of good forestry practices to all timberland owners and users of forest products.

Through the operation of committees, by the functioning of Chapters, Sections, Divisions, and the Council, and by expressions of the membership through referendums, the Society helps establish the policies and standards to be observed by professional foresters.

REPRINTS AVAILABLE

Reprints of this Consulting Foresters Directory are available from the Society of American Foresters, Mills Building, Washington 6, D. C., at the following rates, plus mailing charges.

Number of copies			
			Additional
25	75	100	100
$15.00	$17.00	$20.00	$5:00

CONSULTING FORESTERS, CLASSIFIED BY STATES

Consulting foresters are listed below according to the state in which each has headquarters.

Alabama
- Glenn O. Antonie
- Deep South Consulting Foresters
- Pomeroy & McGowin
- William R. Sizemore & Co.
- Southern Timber Management Service

Arkansas
- Pomeroy & McGowin

California
- Charles H. Bunting
- California Foresteering
- John D. Coffman
- Fenner & Day Co.
- Emanuel Fritz
- Hammon, Jensen, and Wallen
- Arthur Koehler
- Robert T. MacDougall, Jr.
- Floyd L. Otter
- Dean Solinsky
- Everett R. Stanford
- Wall and Larson
- Edward H. Werner
- Western Timber Services

Colorado
- Fred Stell

Connecticut
- Connwood, Inc.
- Kiefer and Quaile
- Donald K. Maissurow

District of Columbia
- Albert G. Hall & Associates

Florida
- Floyd F. Clark
- Francis H. Clifton
- Deep South Consulting Foresters
- Forestry Aids
- Gene M. Harris
- Douglas F. Horan
- T. M. Howerton, Jr.
- John E. Hudson
- Robinson Improvement Co.
- Southeastern Foresters
- Woodland Managers
- J. E. Woodman

Georgia
- W. R. Barnhill
- Edward J. Clancy
- Charles F. Evans
- Jack M. Hall
- E. T. Hawes
- G. E. Knapp
- The Langdale Company
- T. A. Liefeld
- Thomas A. McFarland
- John G. Rawls
- Tom Reimer
- Owen L. Riley
- Southern Timber Management Service
- J. M. Tinker

Idaho
- Intermountain Timber Service
- Penta Post and Treating Co.

Illinois
- John C. Van Camp, Jr.

Indiana
- Carl M. Carpenter
- Consulting Foresters
- Philip C. Meinzer

Iowa
- C. V. Fisk

Kentucky
- Dudley C. Carey

Louisiana
- Henry L. Bango
- Frank W. Bennett & Associates
- Henry Bull
- Inman F. Eldredge, Sr.
- Farmcraft Associates, Inc.
- Ralph W. Hayes
- John F. Kellogg
- Frank J. Lemieux
- Fred B. Merrill
- Leslie A. Sample

Maine
- Philip T. Coolidge
- Forestry Associates, Inc.
- Prentiss & Carlisle Company, Inc.
- James W. Sewall Company

Maryland
- John F. Davis
- L. J. Enright
- William E. Garvey, Jr.
- James R. Simmons

Massachusetts
- C. P. Cronk
- New England Forestry Foundation
- New England Silvicultural Service

Michigan
- Forestry Associates, Inc.
- Forestry Consulting Services
- Northern Tree Co., Inc.
- Eino Sainio
- Robert D. Washburn

Minnesota
- William T. Cox
- Joseph P. Ogrinc
- Roy Dale Sanders
- Raymond E. Stevens

Mississippi
- Robert K. Boydell
- Keith Cranston & Associates
- Randle J. Dedeaux
- Employment Service
- Forestry Suppliers, Inc.
- Lauderburn-White
- James M. Vardaman & Co.

Missouri
- National Timber Consultants

Montana
- Paul E. Bruns

New Hampshire
- Francis G. Hambrook
- William P. House
- H. Thorn King
- George W. Morrill, Jr.
- New England Forest Industries, Inc.

New Mexico
- W. T. Doherty

New York
- Raymond D. Adolph
- Allen W. Bratton
- Nelson C. Brown
- David B. Cook
- David S. Findlay
- David H. Hanaburgh
- Hiram L. Henderson
- Richard F. Howard
- LeRoy W. Huntington
- David G. Jennings
- Frank E. Karpick
- Paul C. Lemon
- Raymond M. Miller
- Malcolm A. Milne
- Charles H. Moyer
- Pond & Moyer, Inc., Co.
- A. B. Recknagel
- J. F. Stauss
- John W. Stock
- Henry H. Tryon
- Arthur J. Weinheimer
- Richard E. Wilson
- Paul T. Winslow

North Carolina
- Thos. W. Alexander
- J. Wayne (Pete) Chalfant
- R. W. Graeber
- Alvin B. Hafer
- V. W. Herlevich
- Gorham E. Jackson
- Ralph S. Johnson
- Harvey J. Loughead
- R. A. Morin
- Reed Forestry & Equipment Co.
- Sandhill Forestry Co.
- Edward Stuart, Jr.
- William H. Utley
- J. Atwood Whitman

Ohio
- William J. Bozett
- E. V. Jotter
- Carol W. Marlow
- James V. Meteer

Oregon
- Bigley and Feiss
- Brown and Brown
- Carl F. Ehelebe
- Vernon A. Good
- Kenneth Wayne Guenther
- G. W. Hult
- R. Wilson Hutchinson
- Stuart Moir
- Wm. B. Osborne
- Charles E. Reynolds
- Arthur E. Sherman, Jr.
- T. J. Starker and Son
- Tree Farm Management Service
- Western Timber Service
- K. B. Wood & Associates, Inc.
- Lawrence W. Zach

Pennsylvania
- S. Gayley Atkinson
- Nelson C. Brown
- C. Dana Chalfant
- W. G. Edwards
- Reginald D. Forbes
- R. C. Fraunberger
- LeRoy Frontz
- Nathan B. Golub
- Robert Moore
- Nittany Timberlands, Inc.
- Northeast Forestry Service
- Northern Timber Services
- R. B. Shannon & Associates
- James G. Yoho
- E. A. Ziegler

Rhode Island
- Monterey L. Holst

South Carolina
- John R. Allison
- Milton Applefield
- John C. Billingsley
- Bishop Brothers
- Lewis M. Boice
- Lucas M. Dargan
- Forest Products Mgnt. Co.
- Forestry Aids
- Giles G. Hall
- Joseph F. Havel
- Robert F. Knoth & Co.
- Milliken Forestry Co.
- Ernest Nutting & Co.
- A. P. Russell
- Joseph A. Schmidt
- Samuel S. Snook
- S. Leigh Wilson

Tennessee
- Ernest E. Ahler
- Paul B. Davis
- Green's Timber Service
- M. E. Jelley
- Frank M. Langford
- William J. Mills
- Charles R. Page, Jr.

Texas
- L. L. Bishop
- N. D. Canterbury
- Stuart F. Clark
- Farmcraft Associates, Inc.
- George M. Fisher
- E. D. Marshall
- James T. McMahon
- Frank Spearey
- W. W. Talbert
- Texas Pine, Inc.

Vermont
- Halsey M. Hicks
- William H. Meyer
- Sable Mountain Corporation

Virginia
- E. A. Friend, Jr.
- S. G. Keedwell & Co.
- Edward A. McAllister
- R. B. Milne
- Edward Stuart, Jr.
- Herman Work

Washington
- William A. Eastman, Jr.
- George S. Haynes
- Robert W. Jones
- L. D. Lloyd
- Marion N. Nance
- Samuel A. Newman
- W. H. Price
- C. D. Schultz & Co., Inc.
- Robert E. Worthington

West Virginia
- Forest Land Management
- Tillinghast & Reed

Wisconsin
- George Banzhaf & Co.
- S. A. Wilde

Canada
- Belanger and Bourget
- John D. Gilmour
- F. J. G. Johnson
- Leon A. Nix
- C. D. Schultz & Co., Ltd.
- James W. Sewall Co.

Africa
- Nils B. Eckbo

6000 hours before its first overhaul!

Clearing underbrush and building roads in a stand of sugar pine, yellow pine and red and white fir near Viola, California. Production here, with one D7 road building, one arching and two ground skidding, averaged 200,000 bd. ft. per 9-hour day.

D7 PURCHASED IN 1947 STILL GOING STRONG AFTER 11,000 HOURS OF HARD WORK

This CAT* D7 Tractor with No. 7A Bulldozer and Hyster winch is one of four D7s owned by Ned Putnam, Klamath Falls, Oregon. At the time this picture was taken last year near Viola, California, he said: "We work our Caterpillar equipment under some pretty tough conditions. This D7 had about 6000 hours on it before we overhauled it. And now, with 11,000 hours on it, it's still doing fine."

Stamina and the capacity for hard work are *built* into this husky unit. For example, the No. 7A Bulldozer blade, of heavily reinforced construction, is *matched* with the D7's horsepower, weight and traction for big production. Designed to *roll* the dirt in heaping loads, it also has maximum strength at points of stress to stand up under a beating. The operator, sitting down, has a clear view of the job, plus "finger-tip" steering for positive control of each track for maneuvering in tight spots.

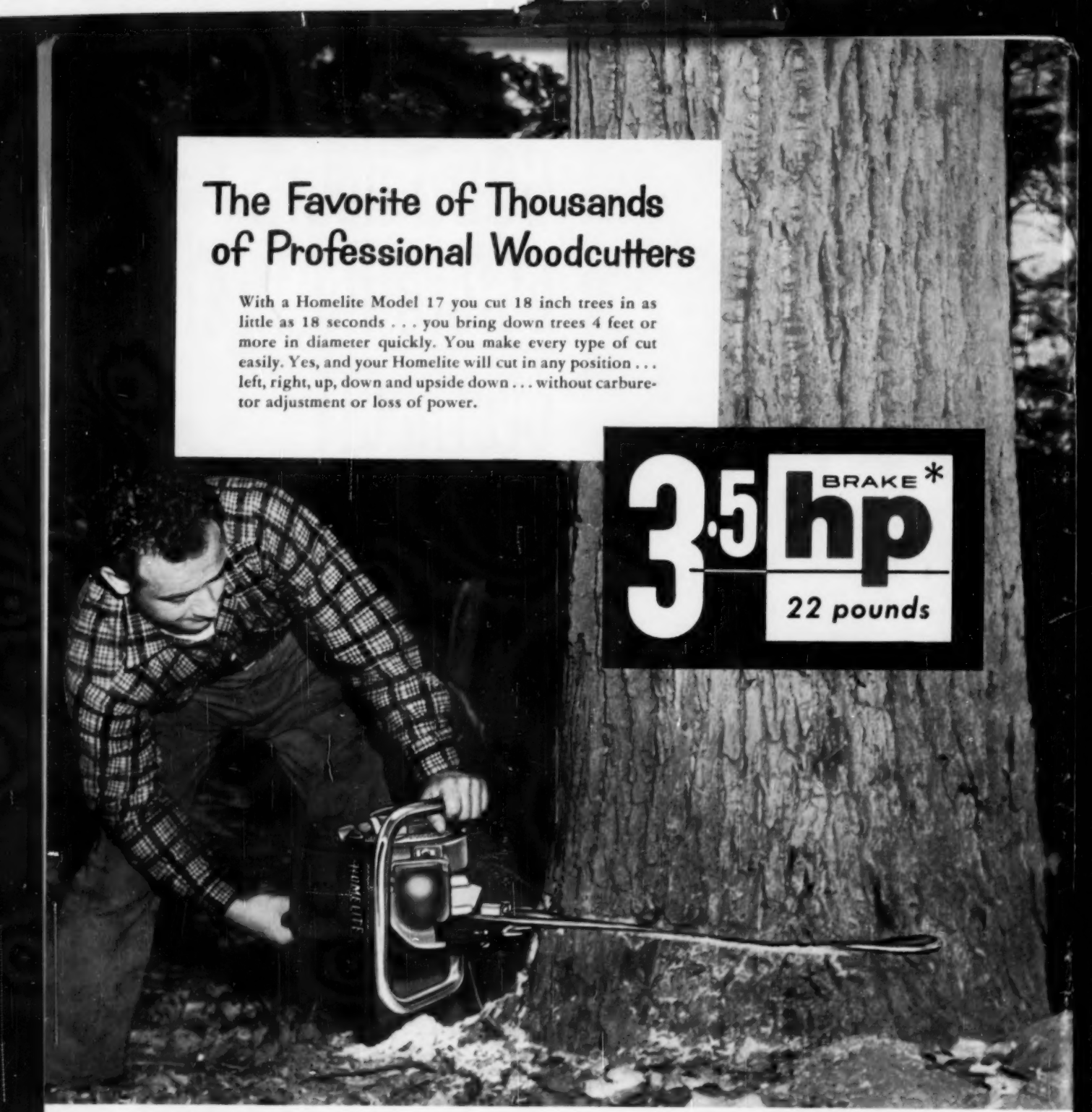
When you invest in a D7, you get a tractor engineered to do *more* work at *lower* cost with *less* down time than any competitive machine. You get a unit built to stay on the job year after year. And you're backed by a reliable source of service and parts — your nearby Caterpillar Dealer. Ask him for the latest information about the D7 with its new oil-type clutch, which enables you to operate much longer between adjustments and replacement than with the conventional dry clutch. Name the date — he'll be glad to demonstrate!

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks — ®

USE CAT EQUIPMENT FOR LOW-COST PRODUCTION



The Favorite of Thousands of Professional Woodcutters

With a Homelite Model 17 you cut 18 inch trees in as little as 18 seconds . . . you bring down trees 4 feet or more in diameter quickly. You make every type of cut easily. Yes, and your Homelite will cut in any position . . . left, right, up, down and upside down . . . without carburetor adjustment or loss of power.

3.5 BRAKE* hp

22 pounds

*actual dynamometer rated brake horsepower

Don't let the very light weight of a Homelite Model 17 chain saw fool you. This fast-cutting 22 pounder is a real production saw . . . one that will stand up in the woods under steady commercial cutting. That's the only type of saw Homelite makes . . . a rugged high-production saw that needs a minimum of maintenance. With this dependability, combined with 3.5 horsepower packed in a saw that weighs only 22 pounds, it's easy to see why the Homelite Model 17 is the favorite of thousands of professional woodcutters.

PERFORMANCE · DEPENDABILITY · SERVICE

HOMELITE CORPORATION

4101 RIVERDALE AVENUE • PORT CHESTER, N. Y.

Canadian Distributors: Terry Machinery Co., Ltd., Toronto, Montreal, Vancouver, Ottawa